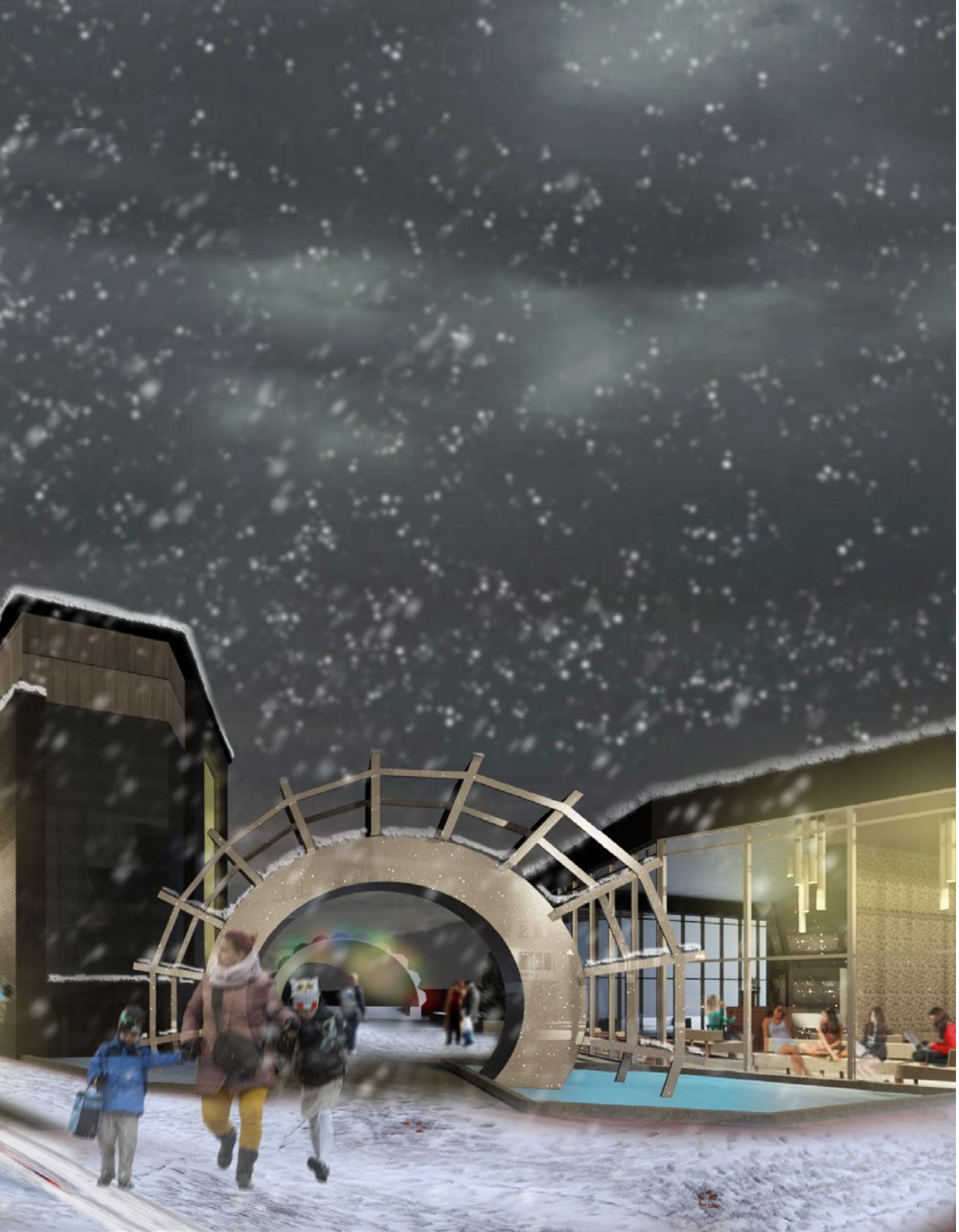

URBAN THAW:

Encouraging Human Connection within a Winter City

Austin J. Foss

URBAN THAW:
ENCOURAGING HUMAN CONNECTION WITHIN A WINTER CITY

A Design Thesis Submitted to the
Department of Architecture and Landscape Architecture
of North Dakota State University

By

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In Partial Fulfillment of the Requirements
for the Degree of
Master of Architecture

Primary Thesis Adviser

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Thesis Abstract

What makes urban life possible is human interaction. Without it, cities would not thrive. It has become increasingly easier for residents of cities to stay indoors and neglect the environment and people around them. In smaller cities in the north, this becomes more prominent with less population, and even more prominent during winter when the weather is less than ideal.

In this urban design project, I will be focusing on multi-family housing, gathering space, and outdoor winter activity. The area I have chosen to explore this typology and topic is Grand Forks, North Dakota, specifically the downtown area. This area is well known to me, as I grew up in a small town near it.

The emphasis of this design project is creating a better built environment for winter living. This will encourage residents, new and existing, to interact with the people and neighborhood around them. This will achieve the goals set forth for this project. These goals are to encourage vibrancy through human interaction with the environment and each other, increase comfort through materiality and building orientation that responds to climate, encourage pedestrian and outdoor winter activity through street design and urban planning, and that the choices made within my specific site can be transferred to other small winter cities.

This project is appropriate because urban areas worldwide are growing at enormous rates, and will keep growing. The standard of living of peoples within urban areas should be a focus of designers in today's world. Since human interaction is the basis of these areas, it should also be a focus.

This project will be a cumulation of my design knowledge, with an emphasis on my ability to view design in a larger, more contextual scale. It will also show my basic knowledge of other design professions, urban design and landscape architecture, and my ability to incorporate these into the overall design. The designs themselves will focus on sustainable winter features, materiality, building form, and human scale.

My research methodology will include descriptive and modeling research looking at case studies and building forms that work well in winter environments.

Thesis Narrative

Overview

Cities thrive on human interaction. It is what makes urban living possible. Cities are hubs of human activity, and interaction happens when this activity takes place between two or more individuals. There would not be a need for urban living if these interactions did not take place. It is part of who we are as humans. Social connection is as much of a need to human beings as food or water.

It is increasingly easier for the populace to become, essentially, "hermits." With the increasing technology in social media, Internet shopping, and residential comforts, many do not see a reason to experience the world around them, along with the people in their neighborhood. This is increasingly prominent when the weather outside is less than ideal.

In many smaller northern cities, such as Grand Forks, North Dakota, interaction decreases during the winter season. During the winter, the climate can become uncomfortable to inhabitants, thus creating less active members of neighborhoods. Through climate-sensitive urban and architectural design, we can create more comfortable environments for city dwellers, creating more active places to live, and, in turn, encourage human connection.

Typology

The typology of this project is urban design with a focus on multi-family housing, gathering space, and outdoor winter activity.

Emphasis

The emphasis of this project is Winter City living. It will focus on how to create a better built environment for winter living for new and existing residents of the downtown Grand Forks neighborhood. Focusing on this allows the buildings and their surrounding context to encourage residents to interact with the neighborhood around them during this season.

Goals

The main goal of this project is to encourage vibrancy through human interaction with the environment and each other.

Secondary goals include increasing comfort through materiality and building orientation that responds to climate, and encouraging pedestrian and outdoor winter activity through street design and urban planning

The final goal would be that the choices made within my specific site could be transferred to other small winter cities.

User/Client

The client of this project would be the City of Grand Forks, ND through the Urban Design Commission. The users of this design would be the residents of downtown Grand Forks, with a focus on families moving into the area. It will also affect the residents of Grand Forks/East Grand Forks, and to a degree the population of the upper Red River Valley.

Since one of the goals of this project is to also act as an example for other cold climate cities to follow, future users may also be residents in other smaller winter cities. These cities may include, but are not limited to, Bismarck, ND; Rapid City, SD; Mason City, IA; Billings, MT; and Watertown, NY.

Justification

Urban areas have had a substantial growth worldwide, and they are only going to keep growing in the future. This is happening not only in cities with temperate climates, but cities in colder climates as well. With this influx of population growth in these areas, we, as designers, must address urban problems swiftly in order to maintain or elevate the standard of living of residents within these cities.

As stated before, cities thrive on human interaction. It's the reason for their existence. So in order to elevate the standard of living in urban areas, we as designers need to increase the human interaction within cities. One could argue that this would need to be a top priority as an urban designer.

I grew up in a small town near Grand Forks, and my family and I would travel to the city often. I also had the privilege of working in the downtown area in the summer of 2015 and 2016. Throughout the years I had noticed the changes that were being made downtown. Ever since the flood of 1997, Downtown Grand Forks has been revitalized and is now a destination, rather than an area that you drove through. Even with all of this great change, however, it can still be a desolate place during the winter, which is why I have chosen this problem for my thesis.

Through this project, I will be able to demonstrate my ability to view design in a larger, more contextual scale. This project will exhibit my ability to design within an already existing urban landscape, with its existing character, physical limits, and surrounding building typologies. This will create an interesting design challenge, which will be to create a winter character within the constraints of downtown Grand Forks that will encourage residents to interact with the neighborhood and people around them.

This project will also delve into other design professions, such as urban design and landscape architecture. It will also demonstrate my basic knowledge of these professions and ability to work with them in the future. The main focus will still be on architecture, however, with a spotlight on sustainable winter features, materiality, building form, and human scale.

Design Methodology

The research design methodologies I will be using are descriptive research and modeling research. I will be examining case studies to find out elements of design that work well in winter and also work well for human interaction. I will model different forms that create the best environments in the winter, as well as materiality and lighting.

Design Process

My design process will consist of four parts: research, predesign, design development, and final design. This parts will each have their own

sub-parts. These will be spread throughout the semester as seen in Figure 2.

The documentation of this process will take place weekly through submittals given to my thesis advisor. Files will be organized by week.

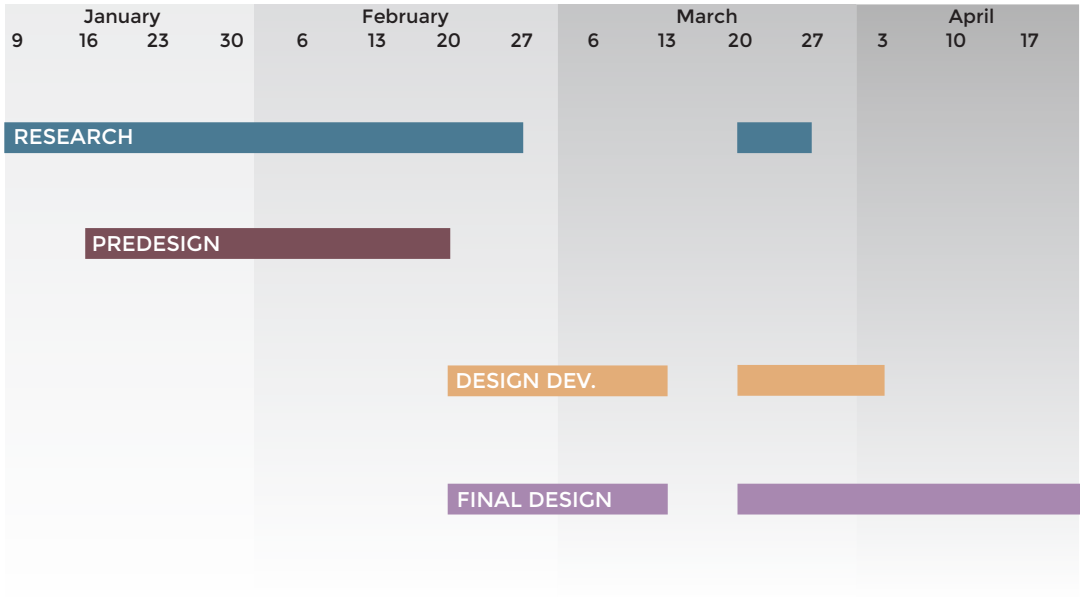


Table 17.1

Figure 17.2

RESEARCH

Figure 20.1

Research Paper: The Winter City

Thesis Statement

Human activity is crucial to a neighborhood's vibrancy and character. One of the main motives for a person to move to a new neighborhood is the character of the place, along with the entertainment, recreation, and human activity that creates that character. Cities with neighborhoods in colder climates have their own unique characteristics just like any other city in the world, but some seem to lose that character in the winter months and in turn become desolate places. A once vibrant downtown neighborhood or shopping center in the months of May through September can seem almost abandoned the rest of the year. Creating a more vibrant neighborhood by establishing a sense of place, connecting the built environment to nature, and making comfortable microclimates will sustain a thriving character during the winter season.

Significance

There is a substantial growth of urban areas worldwide, with more people living in these areas than rural areas for the first time in history since 2007 (United Nations, Department of Economic and Social Affairs, Population Division, 2014). We can see this phenomenon in places such as Fargo, Grand Forks, and Sioux Falls, but is a city still successful if it's growing but not thriving at all times? A majority of the population of these particular cities are reluctant to be active in their communities because of the climate and this, in turn, makes these particular cities unsuccessful. A city is successful only if people actually want to live and experience the space around them. Consequentially this also generates interest for other individuals to move to that particular city. When people only want to experience an urban space for half the year, then that place is only 50% successful.

As human beings, we enjoy comfort, and winter can bring many aspects that can be very uncomfortable for us. Temperatures can be well below freezing, ice covers our streets and sidewalks, and storms with high winds seem to cut through your soul. It's not exactly a pleasant time of the year. A study conducted by Learo Rosen and Norman Rosenthal on the monthly variations in mood, socializing, appetite, weight gain/loss, and sleep length among the general population of the United States found that winter depression and winter weight gain positively correlated with latitude (Rosen & Rosenthal, 1991). The more north you were to travel you would find that people living in these places were more likely to become depressed and gain more weight in the winter. Another study done in Finland found that a large majority of Northern Finland's population, which is on the same latitude as Northern Canada, spent more time at home and inside buildings during the dark and cold times of the year (Ylipulli, Luusua, Kukka, & Ojala, 2014). Northern inhabitants are much more reluctant to go outside and experience a neighborhood around them because of the climate they live in. Winter is perceived as a negative force that generates inconvenience, and discomfort.

Historically, planning and design experts have taken this information and designed space that focus on keeping people sheltered and indoors. This issue has been addressed through mega-malls and networks of indoor stores connected by

tunnels and skywalks where people are removed from the streets and civic spaces (Bergum & Beaubien, 2009). Although this may be effective in changing the environment in a way where people are comfortable, it is ineffective in creating a vibrant neighborhood because it removes people from spaces in which they can interact. Norman Pressman, a major influence in winter city design, quoted "we should not consider winter as merely something to shelter people from, but also expose people to its positive aspects" (Pressman, 1996). We need to improve the comfort and lifestyles of northern inhabitants by creating vibrant environments that foster human connection and activity, and that embrace the climatic context surrounding them.

Figure 22.1

A fairly new shift in thinking, called the Winter Cities Movement, has risen out of these beliefs. The idea behind this movement is that northern cities must have a positive approach to the winter season that benefits the attitudes of current residents, and bolsters the community's ability to attract new business and residents (Coleman, 2008). This movement was pioneered by Ralph Erskine who called for a unique cold climate urbanism. His main principles to be incorporated in this new urbanism were year-round usability, contact with nature, user participation, and cultural continuity (Pressman, 1996). Using these ideas we can create cities that work with their environments. Climate or weather links all scales of human activity, objects, and ideas (Crate & Nuttall, 2009). The least we can do is use the climate to our advantage.

We can change the success of a neighborhood and, in turn, the city in which that neighborhood resides, by increasing human activity and contact. A city is only successful if it fosters and encourages human communication (Sucher, 2003). There are two ways we can accomplish this for northern neighborhoods: through changing the physical environment or changing attitudes toward winter. Although one could change people's attitudes through marketing and other psychological means, a more tangible way to make a neighborhood better for its inhabitants during cold months is through physical means using design. Using the ideas behind the Winter Cities movement, three major things that should be focused on to make a winter neighborhood successful are to create a better sense of place, to make a better connection between the built environment and nature, and to create more comfortable microclimates.

Sense of Place

"Cities are not just lifeless pockets of commerce. Each one has its own personality, its own sense of being. Cities have souls, something at their heart that makes you stick around when you thought you were only passing through," (Robinson, 2012). This quote, from Historic Preservation: Saving Place made by the City of Bellevue, Kentucky with the U.S. Department of the Interior, sums up exactly how cities have and should evolve. They have become more than a necessary place to partake in commerce, a religious shrine, or military center (Sucher, 2003). They each have their own identity or soul, their own sense of place. Sense of place is a large part of a city's success because it is what draws people in.

Through Modernism, we have lost much of what gives cities their sense of place. The focus of modern urban planning has been to divide space based on functionality—living, working, free time, and the transportation between these functions (Jauhiainen & Mönkkönen, 2005). We have been caught up in trying to make a utopian model of a city that works for any environment, disregarding any context or climate variabilities surrounding it. We have essentially created cookie-cutter cities that have no connection to the area in which they reside. They focus on living in an environment where the temperature is comfortable and constant, which is why winter cities become desolate when the temperature becomes too cold for our bodies to handle naturally. We need places that have their own unique character that focus on physical and socio-cultural conditions within a city's context.

To combat the Modernist view of creating a city, we need to first look at creating a climate-responsive urban form. Pressman has quoted " our perpetual summer 'state-of-mind' has been a serious impediment to the development of meaningful solutions for winter living," (Pressman, 1996). We view buildings and urban sites in winter cities as being three-season designs that can only work when the weather is "favorable." This creates a building environment that not only looks aesthetically out-of-place, but are also physically inefficient. We need to create buildings that work with the environment, and consequentially will look like they belong in their context. We can do this by designing architecture in which we have paid close attention to the environment and climate. Some ideas that embrace this are having building materials and structures that withstand a harsh climate, creating buildings that are aerodynamically shaped against the wind, having wind-protected sunny terraces, and designing buildings where their shapes, such as an L-shape, create comfortable microclimates. We can also do this by designing an urban environment that also creates a more comfortable microclimate, which will be clarified in more detail later.

The other major way to establish a sense of place in winter cities is to create a unique northern culture based on context. There are many ways that these cities can use the season of winter to their advantage when creating a unique culture. One way is to place more emphasis on the outdoors and winter activities such as skating, skiing, and snowboarding. This can be emphasized by creating buildings that act as gateways for people to explore and experience the environment during winter. Another way is to use the materials that come with winter. Make public sculptures out of ice, use snow to create barriers for the wind or vehicle traffic, and create hills of snow where children can play. The materiality of each building in an urban setting also will influence the character. The use of "warmer" materials such as wood and stone will naturally create a cohesive urban landscape. Using bright, bold colors will contrast well with the white backdrop and provide visual warmth (Pressman, 1996).

Built Environment-Nature Connection

As was stated before, traditionally we have tried to solve the problem of winter in urban settings by keeping people indoors, therefore not allowing them to experience the neighborhood around

Figure 23.1

them. For many people, being outdoors in winter is almost considered toxic, but why deny a season that contributes to the area's character and landscape? Many northerners often display a perverse sense of pride in their weather extremes, boasting about hardiness, while at the same time avoid the cold at all costs (McKechnie, n.d.). This has created many problems such as residents having much lower levels of activity during the winter, along with creating a very desolate environment (Merrill, Shields, White, & Druce, 2005). We need to create a better transition from the built environment into nature. Having access to nature within the city has been shown to reduce our blood pressure, obesity, attention disorders, and depression, as well as increase our mental acuity (Borys, 2016). Also, sheltering people from their environments creates a neighborhood that is very vehicle oriented and loses people's ability to explore. Opening people up to the world around them will help immensely in creating a vibrant neighborhood during the winter.

Creating a better connection to nature can be achieved first through better pedestrian design and accounting for transportation other than vehicular. Designing for vehicle-free zones that use pavement heating makes much more sense than conventional streets (Pressman, 1996). Trees place on streets help deliver enclosure on pedestrian walkways, and having interesting places to warm up, linger, and connect creates a comfortable environment for residents to make their daily commutes by walking (Borys, 2016). There is also the option of embracing other forms of winter-friendly modes of active transport such as cross country skiing or ice skating. In 1994 Tooker Gomberg, environmental activist and former city councilor, suggested that the city of Edmonton, Canada flood streets so that people could skate to work instead of driving (McKechnie, n.d.). You could also have an extensive network of trails where excess snow could be laid to create a pathway for cross-country skiers to commute. Along each of these pathways, whether it be pedestrian, skating, or cross-country skiing, there should also be heated bus shelters for commutes that take residents out of the neighborhood.

Another element to create a better built environment-nature connection in winter would be to increase seasonal recreation and leisure. Civic spaces should be designed for a variety of uses in both the summer and winter. Ponds or water features can be transformed into skating rinks, amphitheaters into sheltered fire pits, and seating areas into heated shelters (Bergum & Beaubien, 2009). These spaces should also incorporate ice, snow, wind, and sun as positive features for year-round use to encourage active participation for inhabitants. Focus should also be placed on winter-oriented outdoor amenities (Pressman, 1996). These amenities can include a frozen river way for skating, skiing trails, a hockey rink, outdoor arena, and a slalom track. There should also be space for programmed winter events such as carnivals or festivals that focus on the winter season and its positive aspects. All of these elements will be designed in such a way that they are easily accessible from all buildings in the neighborhood, and may even be connected.

Creating More Comfortable Microclimates

Vibrancy can only be achieved if current residents

are willing to go outside and interact with community. In order for them to be willing, the environment needs to be comfortable enough to where minimal outerwear is required. To achieve this, we need to create more comfortable microclimates within a neighborhood. A microclimate is the climate of a very small area, and is usually much different from the surrounding environment. In this case, it would be the microclimate of the urban environment. This can be achieved with good building design and urban planning. Creating spaces that control the environment in a particular neighborhood, but also open up to the world around them and interact with every season, particularly winter, will create these environments.

A large factor to consider when creating microclimates is the wind. Wind can be very perilous in the winter, and is one of the main reason northern inhabitants are reluctant to go outside. Using better methods in street orientation, building densities, and building form will help inhibit the effects of winter winds (Aynsley, 2006). Streets should be oriented in such a way to reduce a wind tunnel effect, and landscaping should be used to protect roadways from drifting snow. Buildings should be oriented together in clusters to created sheltered civic spaces. Civic or residential courtyards can also be created by arranging multi-family dwellings around a single space, creating a more pleasant microclimate where wind turbulence and velocity are significantly reduced (Pressman, 1996). Incorporating irregularities in these buildings' exterior, such as balconies or stepped facades, will also reduce winds speeds (Bergum & Beaubien, 2009).

Another major factor is sunlight. Sunlight should be maximized in every public space where residents will be experiencing the neighborhood. Development should be minimized on north facing slopes, and all building entrances should be on the southern façade. Pathways should also be on the sides of buildings where sunlight is most prevalent, and buildings should not shade pedestrian walkways or civic spaces (Bergum & Beaubien, 2009).

Increasing density and a mixture of uses into a neighborhood will also create a better microclimate socially by making it easier to accomplish daily tasks, socialize with others, and entertain oneself. Increasing density will also create areas of refuge that are protected from the wind. Inhospitable surroundings should be blockaded by clustering buildings and a spatial configuration which is relatively compact. These buildings should also have a variety of diverse elements to maximize satisfaction of personal, family, and group needs (Pressman, 1996). It is much more useful to residents to have their daily needs available to them within a five-minute walk, rather than trying to find a place to park on the snowy streets. There should also be nodes of activity within the neighborhood where the microclimate is very enjoyable and pedestrian and other transit ways are easily connected.

Lighting is another aspect of a neighborhood that should be considered when creating a more pleasant environment. Lightning can create a more dynamic environment for northern inhabitants, and will also be needed for safety as the winter season is the darkest time of the year. Well-designed lighting treatments within buildings and landscapes will offset the darkness and monotony

of the winter season (Coleman, 2008). Buildings with dynamic plays of light will be beneficial not only aesthetically, but can also create a warm winter atmosphere.

Conclusion

Climate or weather links all scales of human activity, objects, and ideas (Crate & Nuttall, 2009). If we choose to disregard it, one's connection to the community is lost. This problem arises when cities in our northern hemisphere choose to disregard the season of winter and not embrace it as part of their character. This problem should be addressed through creating a better sense of place, making a better connection between the built environment and nature, and creating more comfortable microclimates. If these three solutions are accomplished, current residents will be more active within their communities, the comfort and lifestyles of these residents will be improved, and it would create more appeal to move into the city. The end goal would be a model for all cities in colder climates to follow, creating more vibrant communities for the future.

Annotated Bibliography

Aynsley, R. (2006). Wind Engineering in Large Scale Urban Design. In Earth & Space (pp. 1–7). American Society of Civil Engineers. Retrieved from http://ascelibrary.org/doi/abs/10.1061/40830%28188%29109

In this section of the book Earth & Space published by the American Society of Civil Engineers, Aynsley takes a closer look at the opportunity to use wind engineering in urban and suburban development. He focuses on how street orientation and building density can encourage summer breeze penetration or inhibit the chilling effects of winter winds. Using his research in air flow for thermal comfort, he shows how urban designers could use wind tunnel studies and computational fluid dynamics to create better urban environments. He states how working with wind engineers during the early stages of design would be very beneficial in creating thermally comfortable urban and suburban areas.

Bergum, C., & Beaubien, L. A. (2009). Smart Growth and Winter City Design.

This bulletin, written by Carol Bergum and Lee Ann Beaubien of the City of St. Albert Planning & Development Division, speaks upon how northern communities do little to embrace the climate. As part of the Smart Growth initiative proposed for the city of St. Albert in Canada, they offer solutions for community design that should be considered for a winter climate. Key elements that are focused on in this bulletin are building design, neighborhood densities, street layout, civic space design, energy consumption in winter, and changing attitudes of residents about the winter season.

Borys, H. (2016, January 7). Walkable Winter Cities. Retrieved from http://smartgrowth.org/walkable-winter-cities/

Walkable Winter Cities is a blog post from the Smart Growth Voice, a blog created by Smart Growth Online. Smart Growth refers to development that supports economic growth, strong communities, and environmental health. This post focuses on how to design urban environments that are friendly to pedestrians. Borys brings up many good points that center around the human scale, outdoor rooms, and the power of play. There is also a reference to Edmonton, Canada's Freezeway, which is a plan to create a multi-use track in the city that would be used for bicycling in the summer and ice skating in the winter.

Coleman, P. (2008). Living in Harmony with Winter. The Urban-Rural Connection, (Winter 2008), 1, 6.

Coleman, a town planner of Houghton, Michigan, outlines several recommendations and winter design guidelines in this article written for the Urban-Rural Connection, a seasonal publication for United Growth for Kent County in conjunction with Michigan State University. As the founder of the Winter City Institute, he has extensive knowledge in the realm of urban planning for cold climate cities and promotes the livable winter city. The article outlines solutions for site design, building design and density, road design, snow management and storage, vegetation, and pedestrian circulation.

Crate, S., & Nuttall, M. (2009). Climate and Weather Discourse in Anthropology: From Determinism to Uncertain Futures. In Anthropology & Climate Change, From Encounters to Actions (pp. 70–86). Walnut Creek, CA: Left Coast Press., Inc.

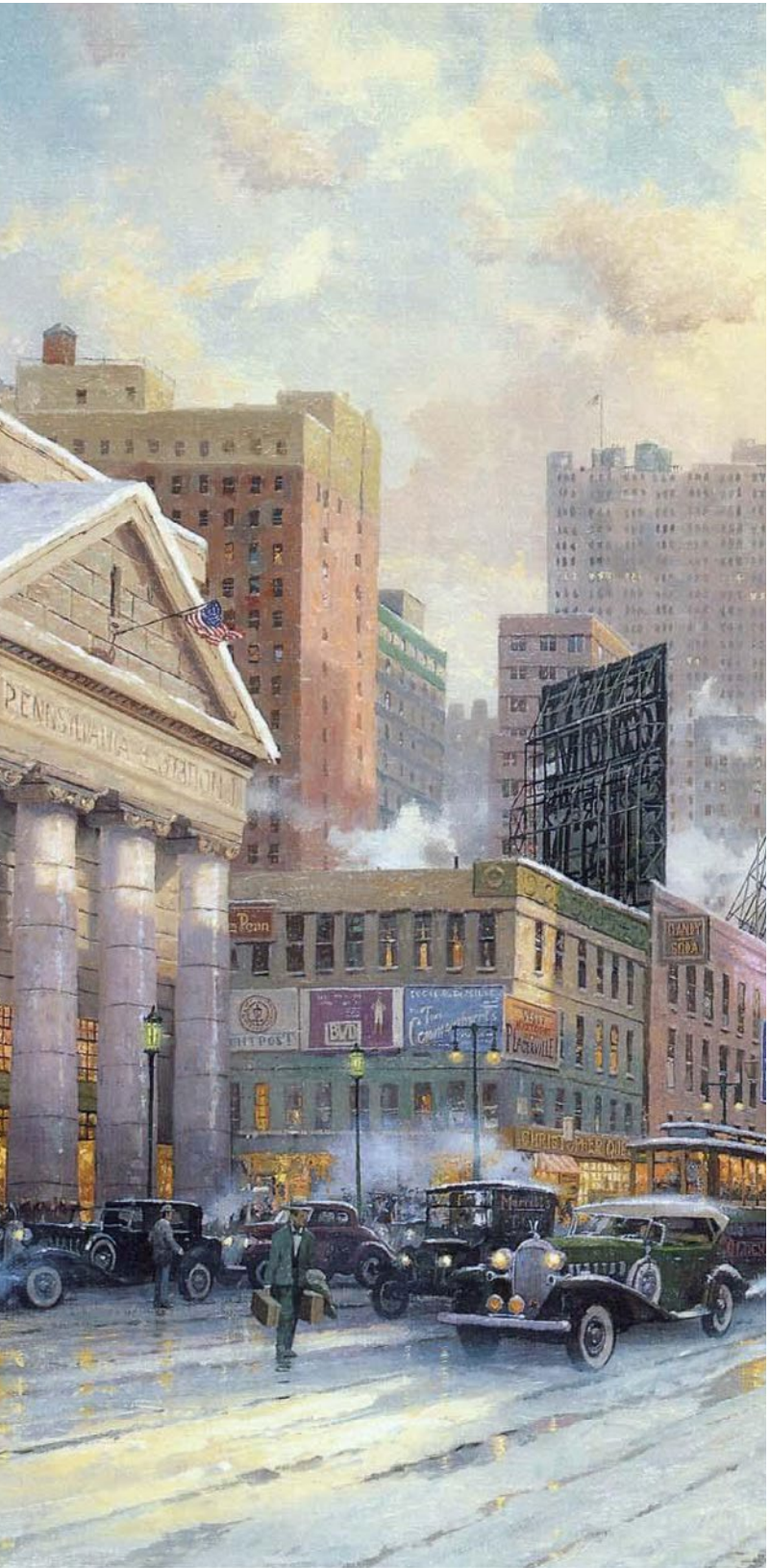
This book section, from Anthropology & Climate Change, shows readers how climate can affect the mental state of humans and society as a whole. They state that climate affects all aspects of human activity, and explain how climates can discourage our state of minds. Their research precedents consist of, not only anthropological research, but psychological research studies as well. Their conclusion to this problem is that we, as human beings, need to work with our climates.

Jauhiainen, J. S., & Mönkkönen, M. (2005). Seasonality: Nature, People's Preferences and Urban Planning in Oulunsalo, Finland. Landscape Research, 30(2), 273–281. https://doi.org/10.1080/01426390500044499

Jauhiainen and Monkkonen discuss how seasonality exists in nature, is felt by people, and is reflected in urban planning. They used a surveyed the popluation in the Oulunsalo municipality in Finland to see what their preferences were when it came to the changing seasons. The season's change dramatically in Oulunsalo, which made it perfect to use as a case study for this survey. They found that summer was the best season for a majority of peoples, and that almost everyone likes the changing of the seasons. They also concluded that seasonality should be considered when planning urban environments.

Figure 26.1

Figure 27.1



McKechnie, B. (n.d.). Influencing Travel Behaviour in a Winter City.

McKechnie, director of the Green Commuting Initiatives in Manitoba, uses her love of winter to show Winnipeg residents how they can still enjoy the outdoors during this season. She looks at how physical activity varies greatly between each season, and how attitudinal barriers exist in the general population during winter. She introduces new ways to use active modes of transportation during the winter, such as cross country skiing and ice skating. She also uses the ideas created by Dr. Norman Pressman.

Merrill, R. M., Shields, E. C., White, G. L., & Druce, D. (2005). Climate conditions and physical activity in the United States. American Journal of Health Behavior, 29(4), 371–381.

This medical research's objective was to identify the influence that season and climate have on physical activity among U.S. adults. This research was conducted by a collaboration between the health programs of Brigham Young University and the University of Utah. They concluded that season and climate significantly influence physical activity in the United States. The lowest percentage of the population meeting physical activity requirements daily were in moist tropical climates, but more importantly the lowest percentage of people meeting physical activity requirements, averaging over all types of climates, was during the winter.

Pressman, N. E. P. (1996). Sustainable winter cities: Future directions for planning, policy and design. Atmospheric Environment, 30(3), 521–529. https://doi.org/10.1016/1352-2310(95)00012-7

Dr. Pressman, one of the most influential people in the winter cities movement, examines the climate-responsive urban from in this journal article. He shows how northern cities need to mitigate the negative effects of winter to function more satisfactory. He references many influential figures in the climate-responsive urban form movement and summarizes the main ideas behind the movement. He also outlines four elements of urban design that need to be addressed more thoroughly during the winter season; they are the visual environment, human comfort, protective urban devices, and transportation. He goes into great deal about how we should use the natural landscape as well.

Robinson, J. (2012). Historic Preservation: Saving Place. Bellevue, Kentucky: Barking Fish Lounge. Retrieved from https://vimeo.com/35608673

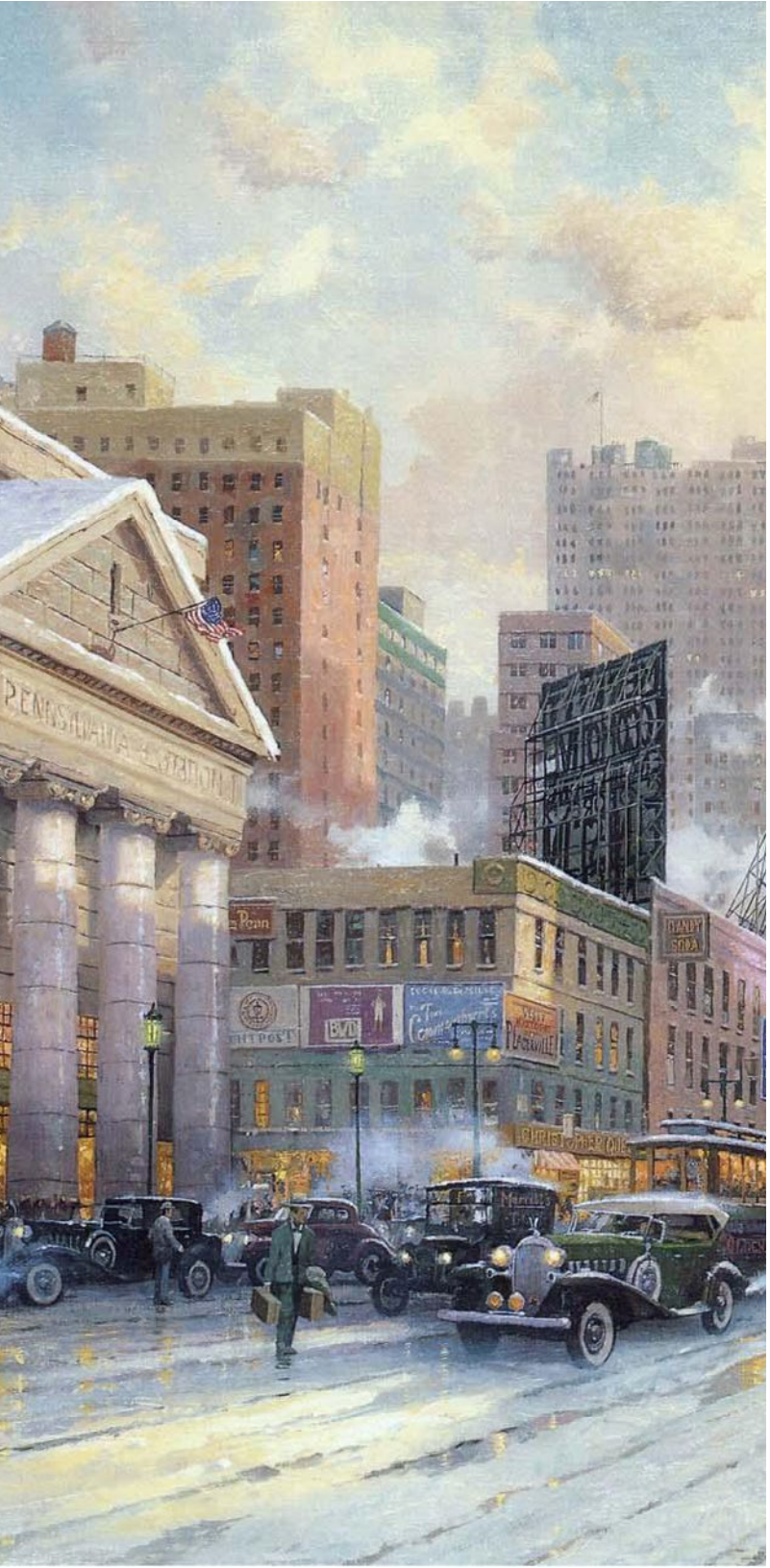
This video, created by the Bellevue Historic Preservation Committee, focuses on how saving buildings and urban environments can create better communities with enhanced character. The video spotlights three cities in Kentucky that each have great historic districts that give the whole region a fantastic sense of place. They interview businesses and residents in the area to show how the communities are thriving because of the buildings that have been preserved. It also highlighted the fact that many Americans choose to travel because of the culture and heritage of a certain place.

Rosen, L. N., & Rosenthal, N. E. (1991). Seasonal variations in mood and behavior in the general population: A factor-analytic approach. Psychiatry Research, 38(3), 271–283. https://doi.org/10.1016/0165-1781(91)90017-J

Rosen and Rosenthal conducted this research in four varied centers in the United States to see if there were extremes in the areas of mood, socializing, appetite, weight gain/loss, and sleep length on a monthly basis. This psychiatry research was conducted to see if there were any factors in these areas with seasonality. The results were that sinter seasonal affective disorder was positively correlated with latitude, while those consistent with summer seasonal affective disorder were negatively correlated with latitude.

Sucher, D. (2003). City Comforts: How to Build an Urban Village. Seattle: City Comforts Inc.

In this book, Sucher explains what an urban village is, and outlines specific ideas on how to create one. This book takes case studies from several cities around the world and presents them in a photographic way. He explains how each photo shows an item that is beneficial in creating an urban village. He also goes into detail how urban designers are mainly responsible for the comfort of the residents they serve, and how the major function of a city is to create human connection.



United Nations, Department of Economic and Social Affairs, Population Division. (2014). World Urbanization Prospects: The 2014 Revision, Highlights (No. ST/ESA/SER.A/352). Retrieved from https://esa.un.org/unpd/wup/Publications/Files/WUP2014-Highlights.pdf

This report highlights the demographics of the world's population, focusing on the urban environments. The main fact taken from this report is that over half of the world's population lives in urban areas. They also speculate that the coming decades will bring further profound changes to the size and spatial distribution of the global population. They also state the rapid and unplanned urban growth threatens sustainable development when infrastructure is not developed.

Ylipulli, J., Luusua, A., Kukka, H., & Ojala, T. (2014). Winter is Coming: Introducing Climate Sensitive Urban Computing. In Proceedings of the 2014 Conference on Designing Interactive Systems (pp. 647–656). New York, NY, USA: ACM. https://doi.org/10.1145/2598510.2598571

This article focuses on how we can use climate sensitive urban computing in the winter season. Even though it focuses on information and communication technology, there was also a study done to determine the amount that technology is used each season and consequentially how much time is spent indoors. They found that much more time is spent indoors in the winter.

Figure 32.1

Hygge Research

Taking a more theoretical approach, I decided to research more about human comfort. The work that I happened upon was hygge, or the Danish art of living well. This idea comes from Denmark, and gives my project a whole new outlook by bringing in a human-focused approach to living well, rather than justified gestures toward making a nice city.

The word itself means many different things. It means a quality of presence and an experience of belonging and togetherness. It is a feeling of being warm, safe, comforted and sheltered. It is also an experience of self-hood and communion with people and places that anchor and affirm us, give us courage and consolation. Lastly, it is a feeling of engagement and relatedness, of belonging to the moment and to each other; it is about being not having.

On the adjacent page are some quotes from Louisa Thomas Brit's book, The Book of Hyyge, which get to the core of the ideas behind it. They are broken up into five main ideas: belonging, shelter, comfort, wellbeing, and simplicity.

Belonging

“We have lost our ability to make meaningful connections, and need to find alternative ways to consume and connect. Hygge introduces the ideas of humanity and warmth back into society.”

Shelter

“The pleasure and intimacy of sheltering is charged by the sounds of life revolving around us. These places are islands of respite rather than refuge, pause not escape.”

Comfort

“Like animals returning to the familiar texture of a lair, we relax more easily in an enclosed, softly illuminated place. The quality of material that surrounds us is essential.”

Wellbeing

“The contentment we feel when we walk down our local street, stopping to talk to familiar passerby, is hygge; to experience a sense of intimacy and basic trust in the good intentions of others.”

Simplicity

“Its cardinal virtues are practicality, simplicity and quality. Calmness of form can encourage calmness of mood. It’s not about style, but feeling and atmosphere.”

Survey

This semester I was able to conduct a survey with Red River Valley residents on their winter perceptions and views on comfort. The survey was taken by 120 participants from multiple cities and towns in the Red River Valley. It was my hope that with this research I would be able to learn more about northern people's preferences in the built environment during winter.

On the adjacent page you will find some questions from the survey that I was able to draw conclusions from. One conclusion is that the participants generally liked "warmer" materials, such as brick and wood. Color's ability to be viewed as comfortable was based on personal preference, but participants specifically found orange and white light comforting. Participants were willing to walk outside during winter, but spent less time with friends outside of their homes. There were also key elements that they found to be missing from their neighborhoods:

-Winter Outdoor Activities
-Winter-Specific Festivals and Events
-Areas of Shelter
-River Use in Winter
-Tree Coverage
-Closer Access to a Mixture of Venues
-Community Gathering Spaces

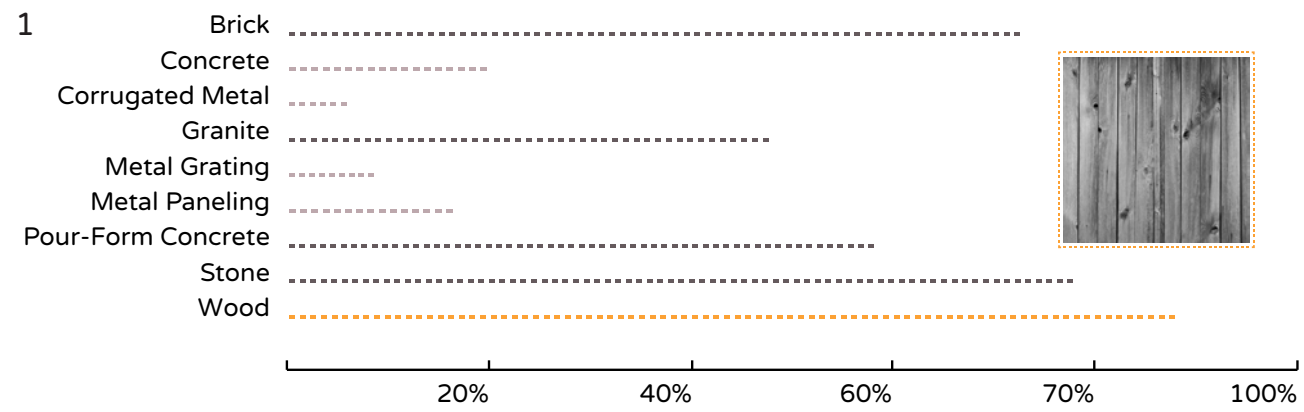
1-3. Choose four of the following images [example in graph] that feel most comfortable and inviting to you in comparison to one another.

4. What is the longest distance you would be willing to walk in the months of December through March?

5. Is the amount of time you spend with friends outside of your homes more or less in the months of December through March than April through November?

6. Do you meet more or less new people in the months of December through March than April through November?

1



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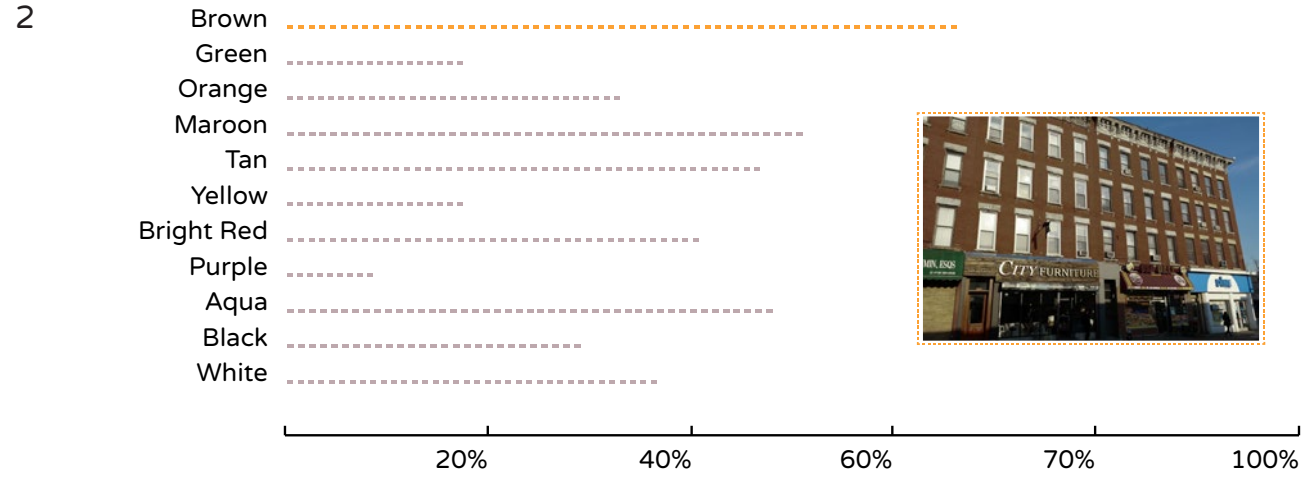

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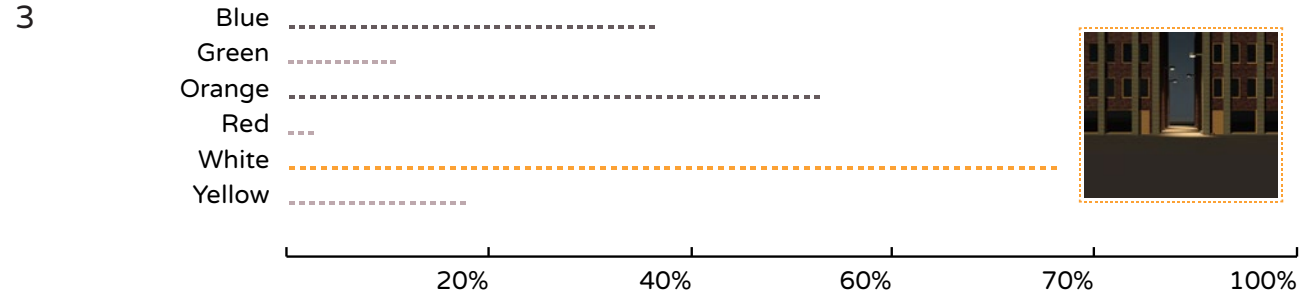

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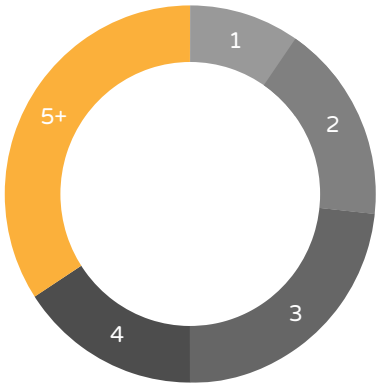

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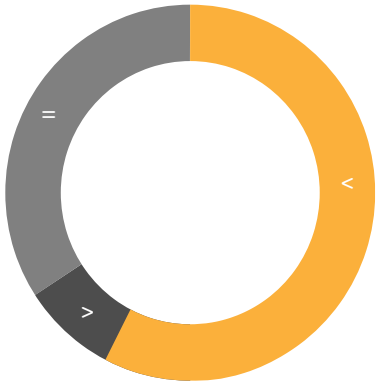

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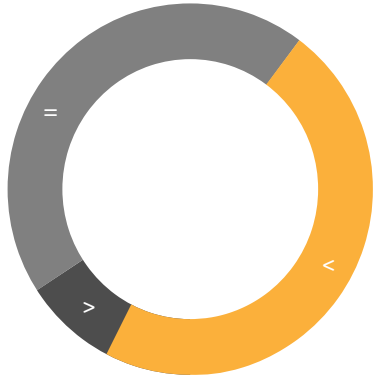


Table 35.1

ANALYSIS

Code Analysis

My project will have several typologies included in it. The two main types will be a multi-family residential building, and a recreational/gathering space building or buildings. According to the international building code, these typologies have occupancy classifications specific to my needs.

The multi-family residential building will be under the R (Residential) occupancy type, specifically R-2. R-2 occupants are permanent, sleeping in buildings containing more than two dwelling units for more than 30 days. These include apartments, dormitories, and long-term residential boarding houses.*

The recreational and/or gathering space building(s) will fall under the A (Assembly) occupancy type, specifically A-3. A-3 occupancies are assembly areas that do not fit into the other Assembly occupancy types. It also includes spaces used for worship, recreation, or amusement.

Assembly A-3

Type IIA Construction
-Noncombustible Materials
-Each Building Element Fire-Rated for 1 Hr.
-Interior Partitions Not Fire-Rated

Residential R-2

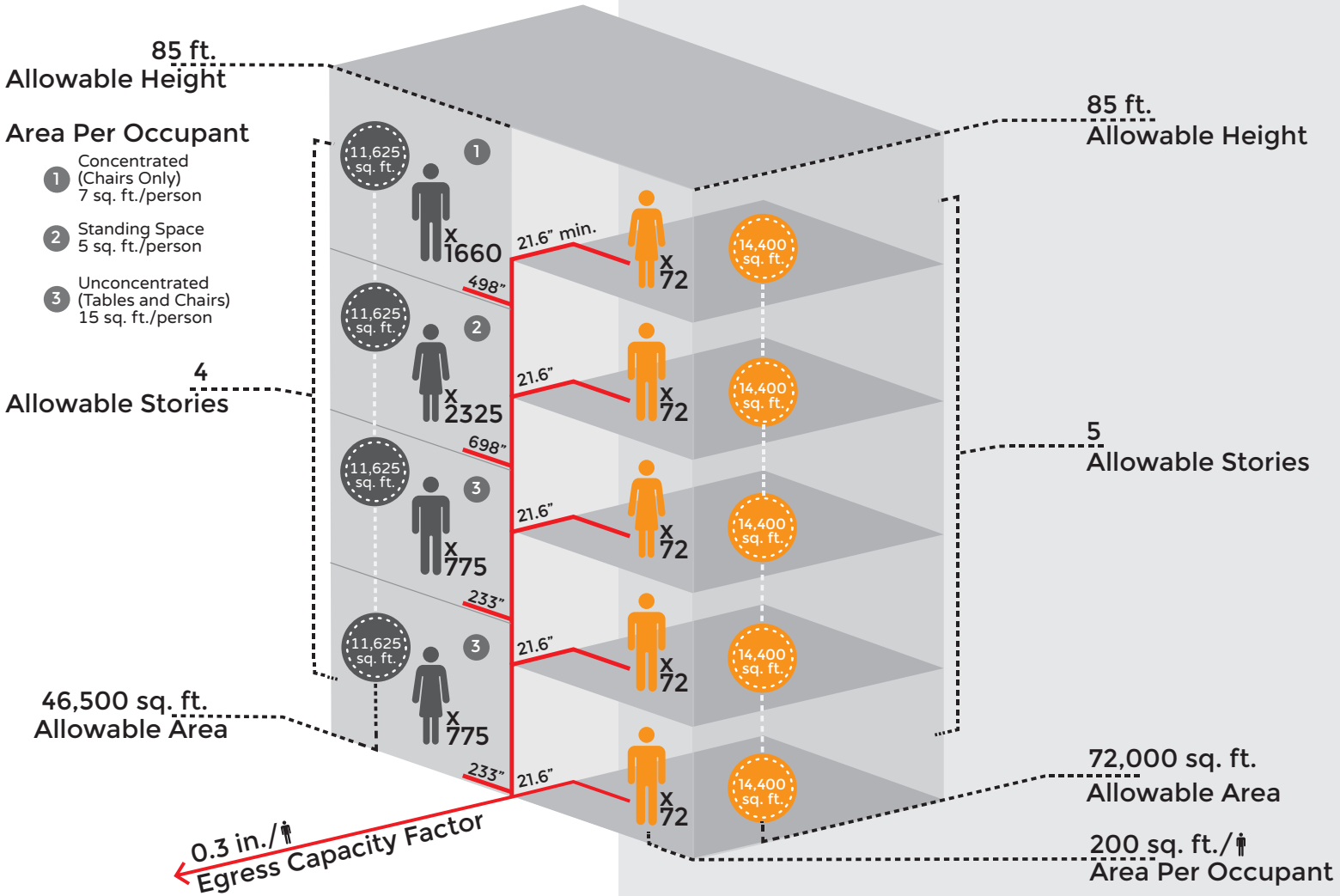


Figure 39.1

Figure 40.1

Downtown Grand Forks: Site Analysis

Grand Forks, North Dakota is a great example of a Winter City. With average low temperatures ranging between -1° F and 18° F during the winter, it can become a very cold place. There is also an average annual snowfall of 42 inches.

Downtown Grand Forks is currently experiencing a cultural and economic boom which started after the flood of 1997. Although devastating, this flood was able to destroy the third street mall, which was arguably one of the main reasons that the downtown area had died. This also created the need to improve and rehabilitate many buildings downtown that were abandoned or falling apart. This has lead to many great developments in the past 20 years, and doesn't seem to be stopping any time soon.

Figure 40.2

This boom would create a perfect opportunity to implement many facets I have been researching in the downtown area. Although many developments have been made, they are still only beginning this movement, making it easier to implement these now then later. There is also a housing shortage in the city of Grand Forks, and creating an environment that not only provides more housing, but better living conditions for all four seasons will be greatly beneficial to not only this neighborhood, but the whole city.

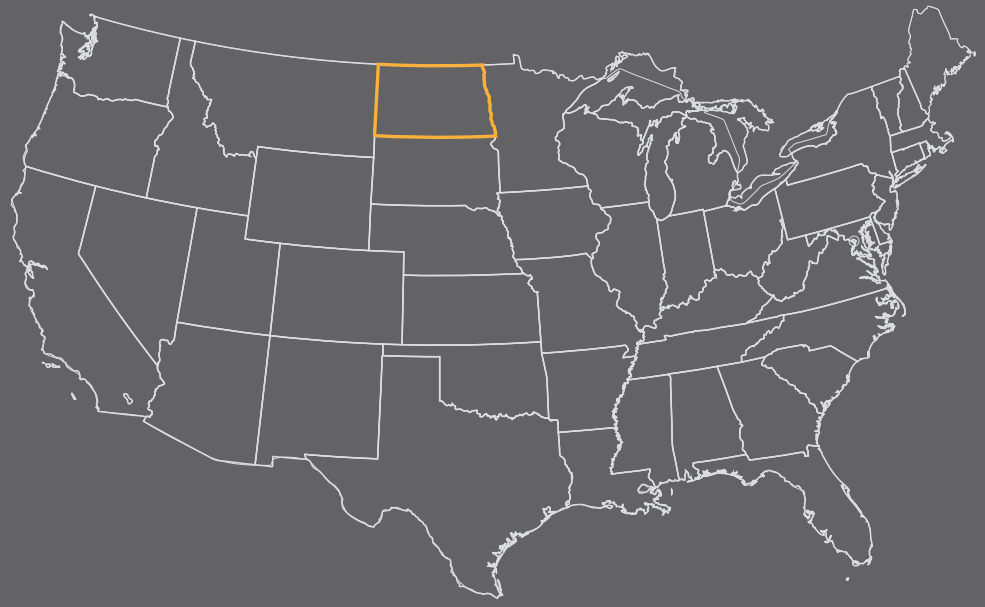


Figure 41.1

Figure 41.2

Figure 41.3

Figure 41.4

Climatic Conditions: Wind

Using Autodesk Flow Design, I was able to determine the wind patterns for my site. The harsh northwest winds are mapped below. Using this data I can determine where wind blockage should be.

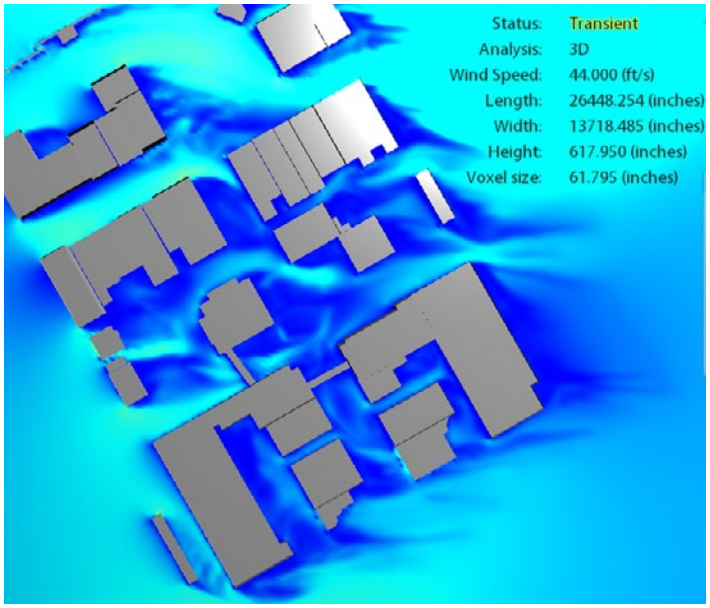


Figure 42.1

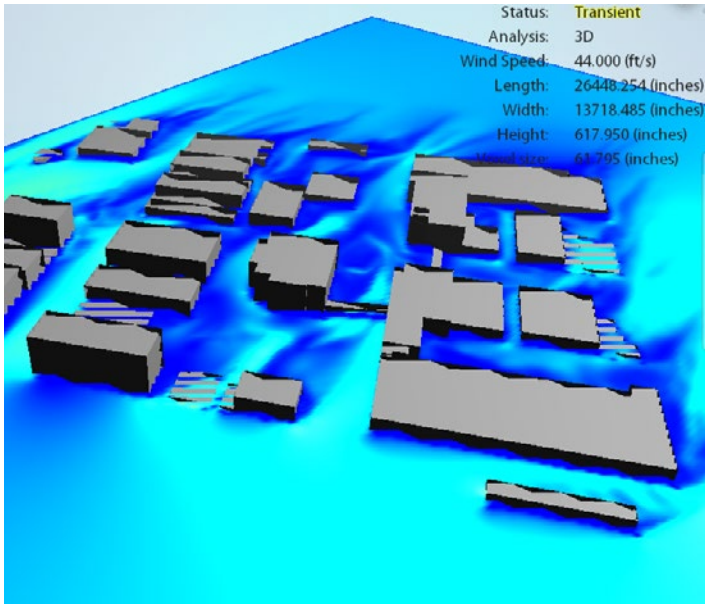


Figure 42.2

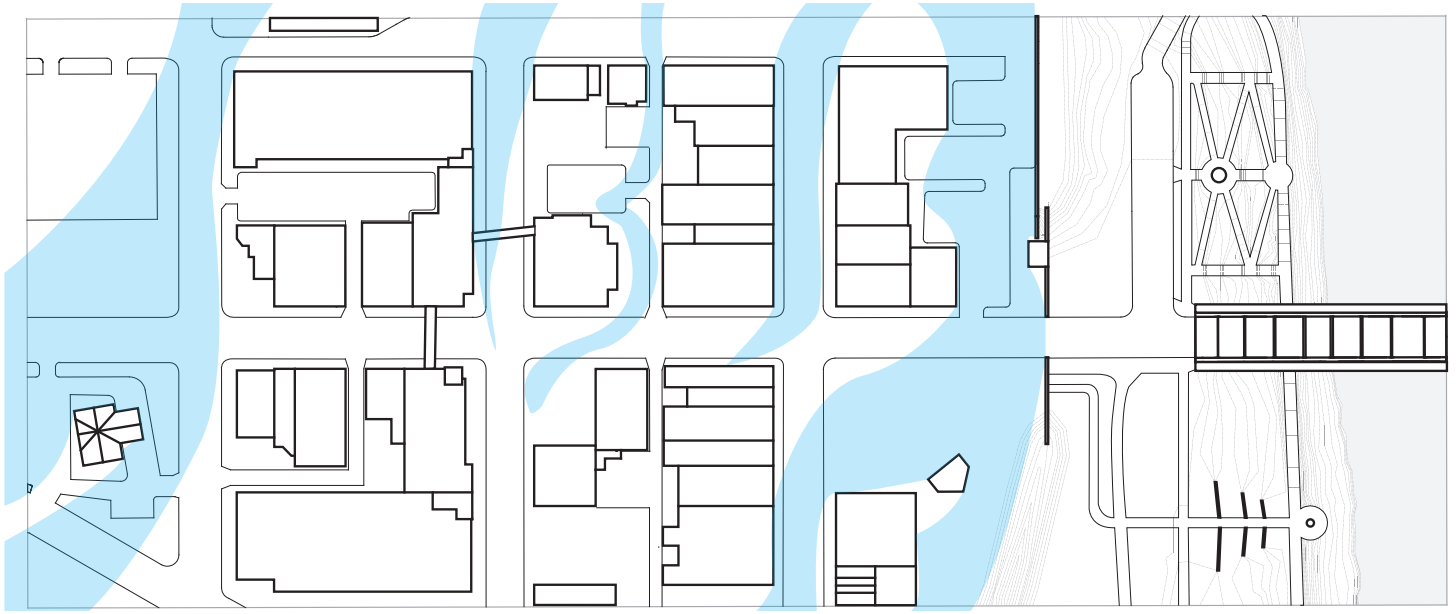


Figure 42.3

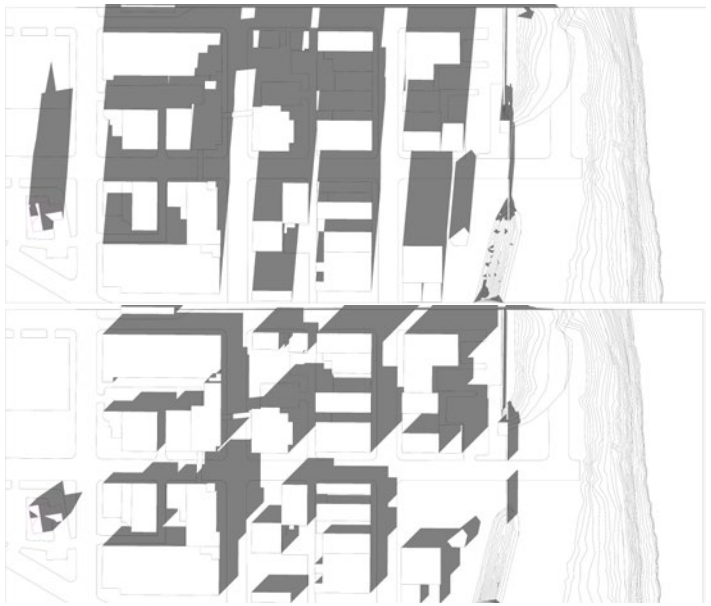


Figure 43.1

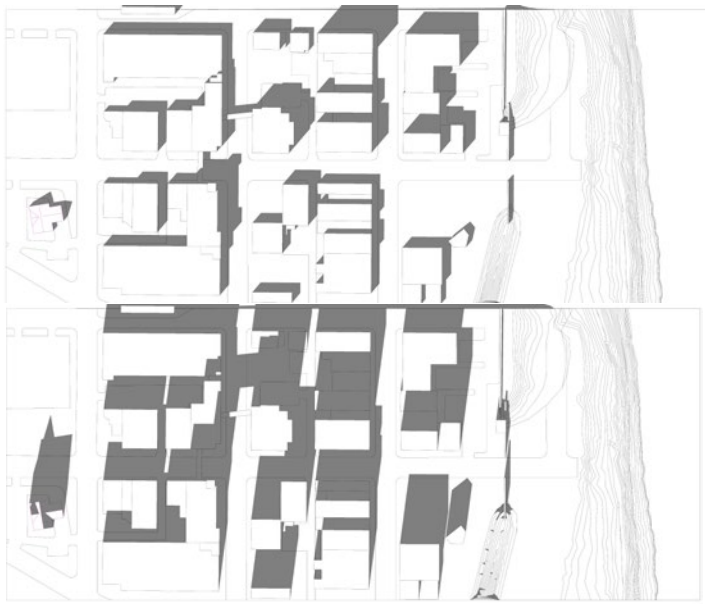


Figure 43.2

Climatic Conditions: Sunlight

Using the sunlight tool in Autodesk Revit, I was able to determine where shadows would be prominent during winter. The images above were taken from two different days during winter using the sunlight tool.

Figure 43.3

Shade Most of Day (Dec - Mar)

Sun Most of Day (Dec - Mar)

Traffic

This map shows the amount of regular traffic that the neighborhood receives. There is a high concentration of vehicle traffic along Demers Avenue, with a moderate amount of traffic coming off of Demers onto third and fourth streets.

Figure 44.1

Living Zones

Breaking the site down into five activities we do every day, I was able to determine what I needed for the new design.

- Gathering
- Needs/Wants
- Rest
- Recreation
- Work

A: Over 21 V: Vacant C: Church

Figure 44.2

Figure 45.1

Figure 45.2

Figure 45.3

Figure 46.1

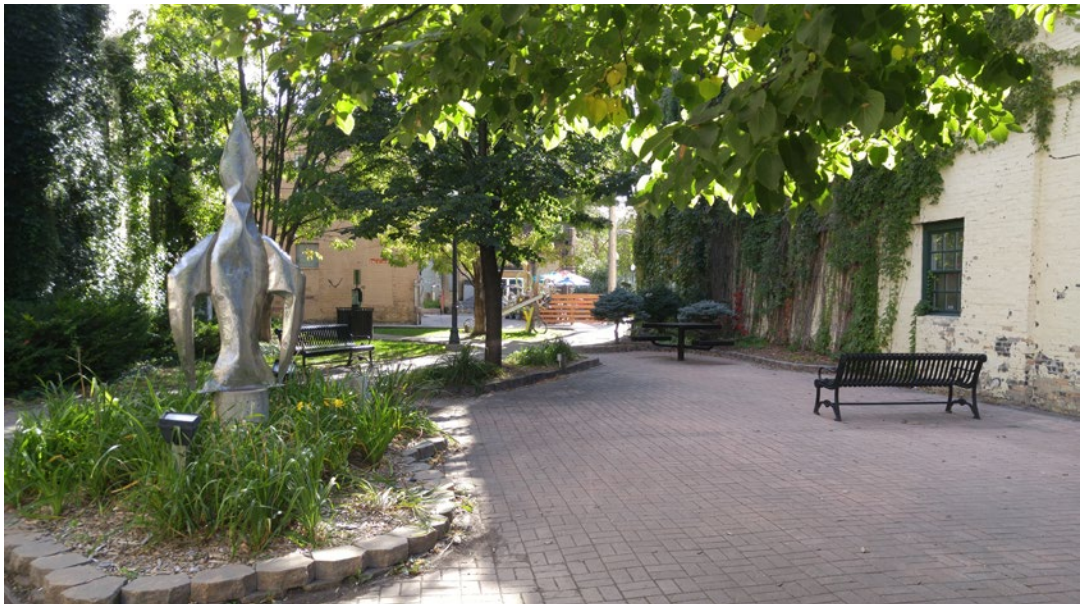


Figure 46.2

Figure 46.3

Figure 46.4

Figure 47.1

Figure 48.1

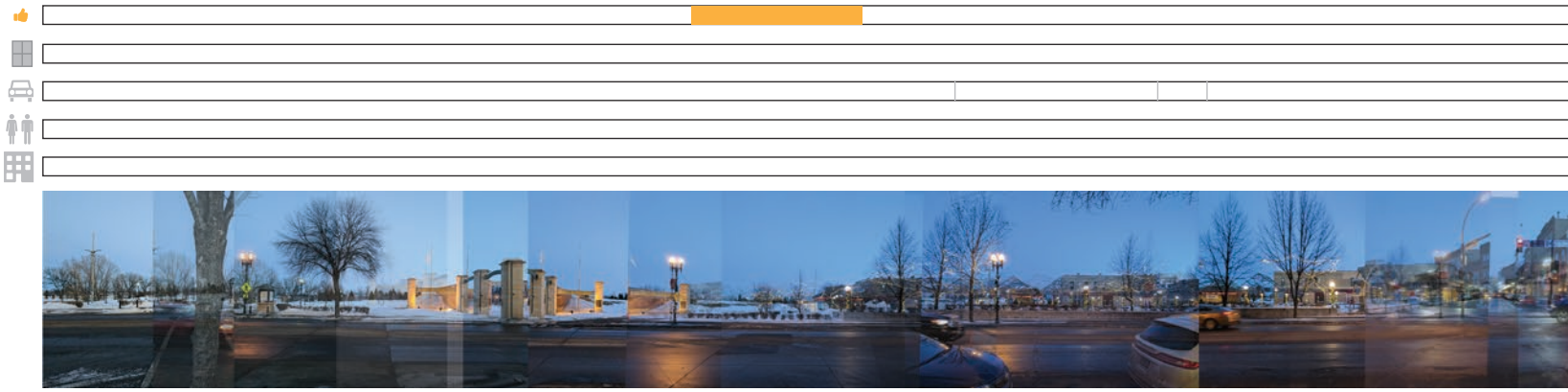
Figure 49.1

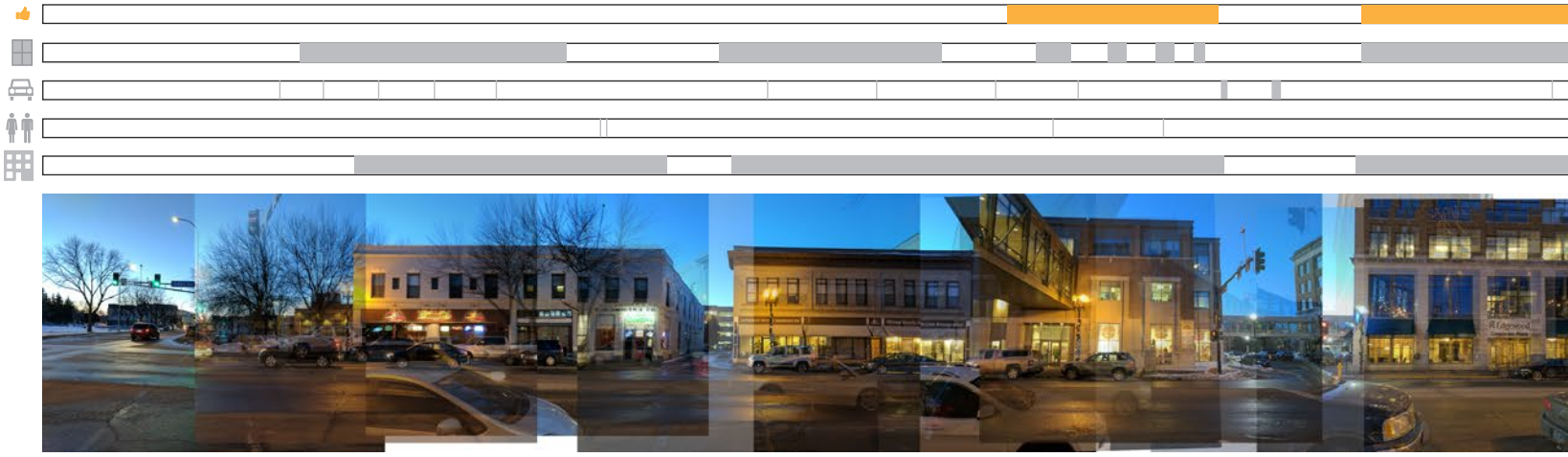
Figure 49.2

Figure 49.3

Panoramic Analysis

As I did in Winnipeg (page 68), I made two panoramic images of each side of Demers Avenue in order to determine where there was activity. I concluded that there is very little activity going on along Demers during the winter, but areas that seemed pleasing to the eye and had the potential to become active were areas with dynamic lighting and high transparency in material.





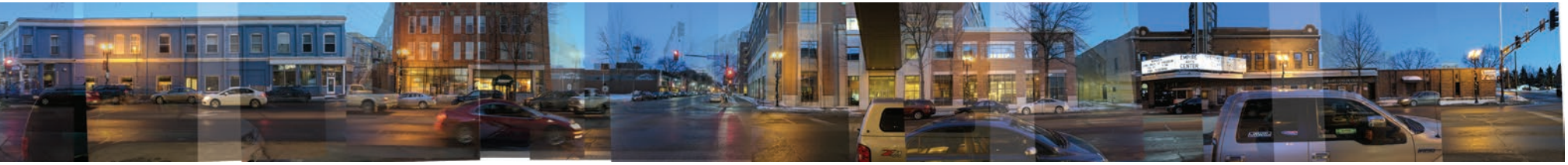


Figure 51.1

Figure 51.2

Figure 52.1

Precedent Analysis: Tjuvholmen

LOCATION Oslo, Norway
DESIGNER Niels Torp
TYPE Neighborhood
SIZE 83,000 m²
COMPLETION 2012

Tjuvholmen is a development that is located on a peninsula in the Oslofjord in Oslo, Norway. It was originally a shipyard owned by Akers Mekaniske Verksted, then converted into docks by the municipality in 1914 until 1982. From 1982 it had been used for office space, terminal, and warehouses. It was not a particularly pleasant place until 2005 when it was sold to private investors. A competition was then instituted to create an urban renewal project with housing.

Niels Torp won the competition with his designed that not only created plenty of housing for the area, but also situated the streets in such a way to focus on breezes, sunlight, and views. The design maximizes the shoreline exposure for residents, with an intertwining mix of avenues, alleys, and canals. The spaces created were proportioned so that none are oversized or barren. The buildings were also designed with moderate heights in keeping within the city's context and allowing the natural hilly landscape to retain its dominant role. (Torp, 2005)

The final project consists of 1,200 apartments, offices, restaurants, and shops. At its furthest tip there is also a contemporary art museum, the Astrup Fearnley Museet, designed by Renzo Piano. This stunning building serves as the focal point to the entire project.

In April of 2016, I was privileged to experience this area first-hand. Even though it was the end of winter, it was quite chilly when we visited Oslo at that time, especially when venturing out into the Oslofjord. What I noticed, however, is that when we roamed around Tjuvholmen I was hardly cold at all, even though it is directly connected to the Fjord. The area was dense enough that it had created a more comfortable micro climate than the rest of Oslo's Waterfront.

Not only was the climate more pleasant in this district, but the scale was as well. The density of the site played well into this as there was no vehicle traffic, so everything was at human scale. This created an ideal environment for the pedestrian, and there were numerous people out and about. The base of each building, no more than two stories in height, was of a different material than the upper portions, making the buildings more permeable for public use.

The material use also worked well for sense of place. The materials involved were mostly glass, dark metals, dark brick, and wood. The aesthetic worked really well together in one cohesive neighborhood. The wood aesthetic, such as in the Astrup Fearnley Museum (Figure 54.3), plays off of the seafaring history of the Oslo region. There are also pops of bright colors (Figure 54.1 and 54.2) that I believe work well to brighten the area during colder, darker months.

Figure 54.1

Figure 54.2

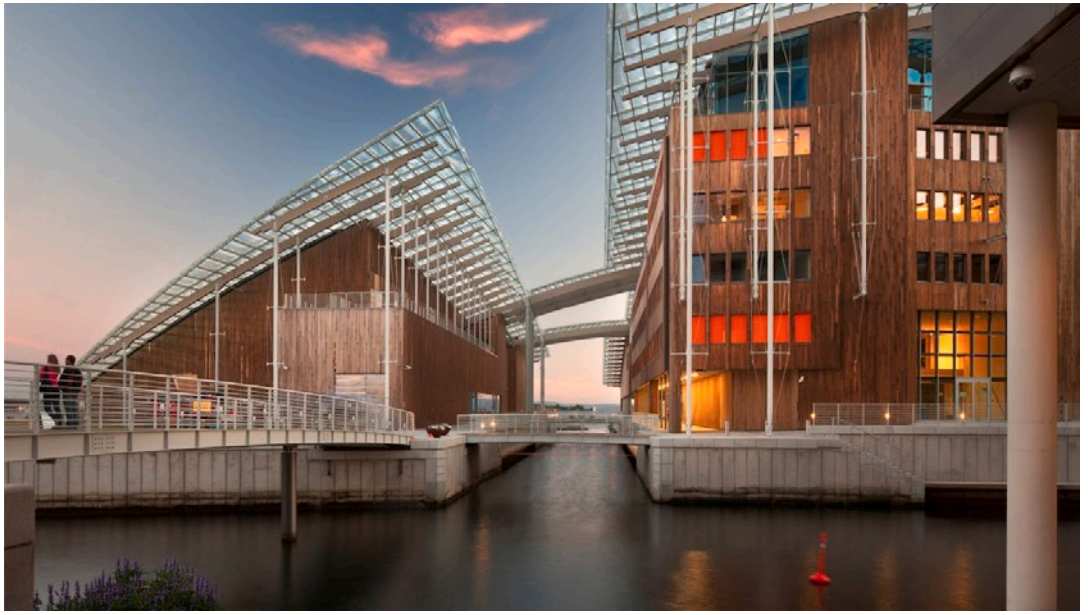


Figure 54.3

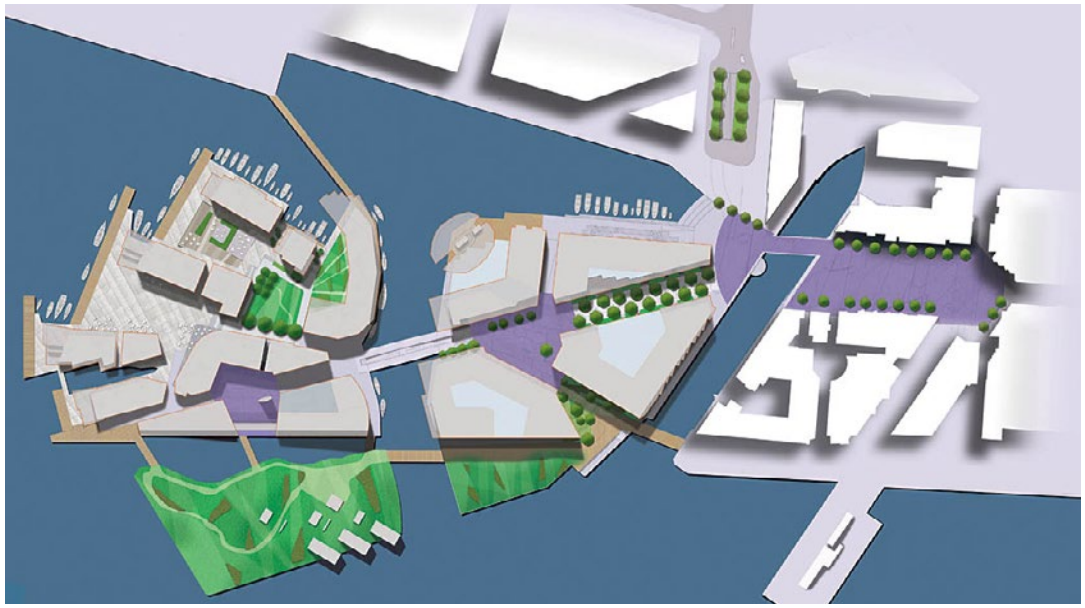


Figure 55.1

Figure 55.2

Figure 55.3

Figure 56.1

Tjuvholmen Conclusion

The elements that work really well in this project are the neighborhood density, human scale, materials used, and street orientation. All of these elements create a beautiful, comfortable environment for residents during all seasons. It also uses the context of its immediate surrounding of the Oslofjord, really well.

I would take these ideas into my design for Downtown Grand Forks. I need to create housing that celebrates the river and use materials that blend with the surrounding context. I also need to have accents of bright colors to contrast against the dull surroundings of winter. Mixed-use buildings will also create better environments for interactions, and create a more diverse environment filled with things to do and see. Human scale also needs to be a high priority when designing, thus making spaces that feel more comfortable for the user.

Precedent Analysis: The Forks

The Forks in Winnipeg, Canada is a community gathering space at the junction of the Assiniboine and Red Rivers. It has been a meeting space for over 6,000 years, taking many forms over that time. It was a major trading area for the indigenous peoples of the area for thousands of years before Europeans started to venture into northern North America. From the late nineteenth century until the 1980s, the site was used as a rail yard until it became a destination for Winnipeg citizens to shop, dine, be entertained, and gather.

The site is nestled in the heart of downtown, making it very easy for residents to venture their way over. It is open twenty-four hours a day all year round, and has attractions for every season. Some of the features of the Forks include a hotel, spa, market (which recently went under a renovation, more on that later), antique mall, eight restaurants, several attractions, a large green space, and two museums. One of these museums is the Canadian Museum for Human Rights, which was completed in 2014 (more on this later). The site is essentially the city's living room, creating an abundance of human interaction and public space for everyone to enjoy. Not only is it successful for residents within the city, but it is also Winnipeg's number one tourist destination with more than four million visitors annually (Forks North Portage Corporation, 2016). The success of the Forks has even started a movement in the planning of Winnipeg to develop the land surrounding its rivers.

The Forks
LOCATION Winnipeg, Canada
TYPE Park/District
SIZE 5.5 hectares
LIFESPAN 6000 years

The Forks Market Food Hall
DESIGNER Number Ten Architectural Group
TYPE Assembly/Food
SIZE 975 m^2
COMPLETION 2016

Canadian Museum for Human Rights
DESIGNER Antoine Predock
TYPE Museum
SIZE 24,155 m^2
COMPLETION 2014

Figure 59.1

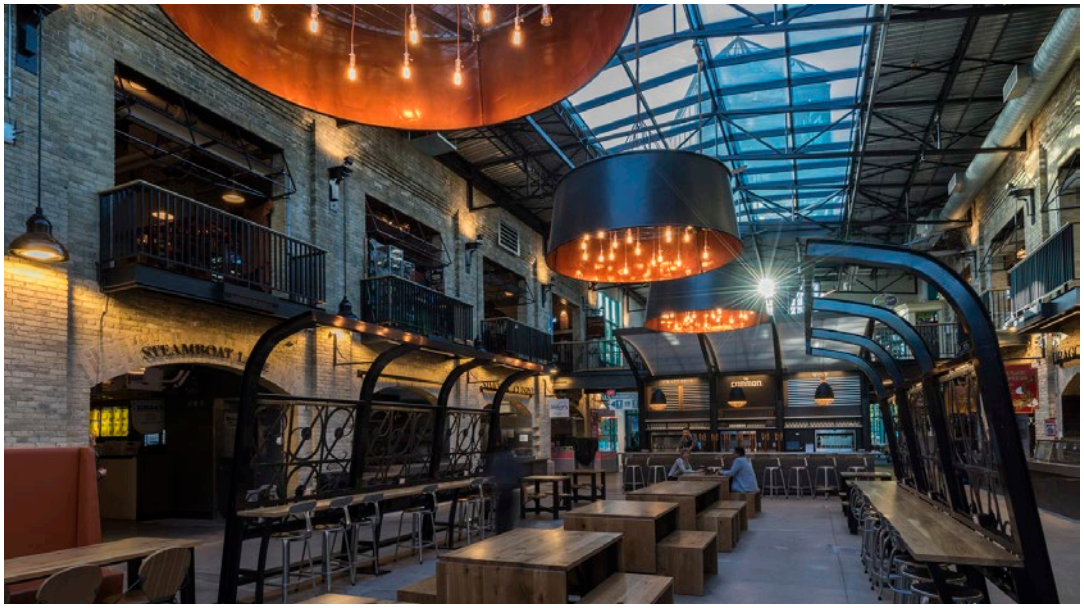


Figure 60.1

Figure 60.2

The Forks Market Food Hall

The Forks Market Food Hall is a recent renovation of one of Winnipeg's most beloved public spaces. This market has acted as the city's living room since 1989, and this new design hopes to re-define the aging interior as a modern food hall and event space.

The two buildings that this space connects were originally machine shops for freight car and coach repair, and later stables for the rail companies. The atrium space was constructed in 1989 to link these buildings, creating a shopping and dining destination. This new design aims to enhance the sense of community in the Forks Market's central court. The space is very flexible, alowwing for large communal gatherings to intimate seating spaces.

The design was inspired by the Forks' industrial past. The main materials used are raw steel, hand forged blacksmith work, and natural wood detailing. It has an exposed steel structure reminiscent of Canada's rail history. The former horse stalls now act as food kiosks with steel front counters, and have a flexible assortment of equipment to accommodate a variety of food and beverage vendors. Suspended above the dining area are large metal drum pendants with glowing LED Edison bulbs that contribute visual warmth and further define the gathering space. (ArchDaily, 2016)

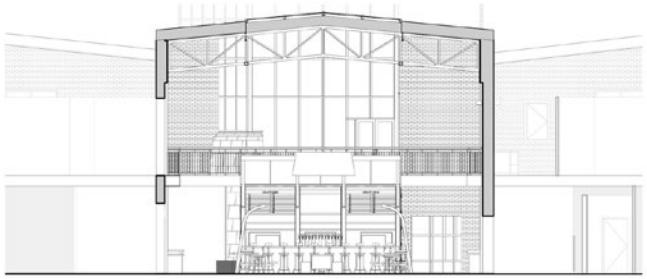


Figure 61.1

Figure 61.2

FLOOR PLAN

1. CRAFT BEER & WINE KIOSK
2. PLANT BENCHES
3. FLEXIBLE HARVEST TABLE
4. CHARGING STATIONS
5. BANQUETTES
6. BUSKER STATION/PRE-FUNCTION/OVERFLOW
7. PERFORMANCE/PRESENTATION/OVERFLOW

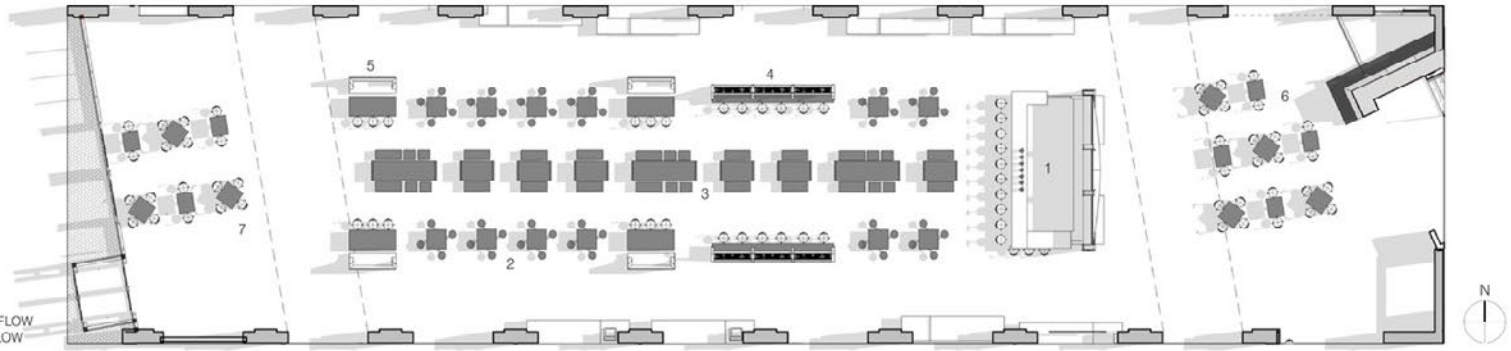


Figure 61.3

Figure 62.1

Canadian Museum for Human Rights

The Canadian Museum for Human Rights is a national museum located in the northern portion of the Forks. The purpose of the museum is to “explore the subject of human rights with a special but not exclusive reference to Canada, in order to enhance the public’s understanding of human rights, to promote respect for others and to encourage reflection and dialogue (Mahabir, 2008).”

In 2003 an international design competition was launched for the new museum, and Albuquerque, New Mexico architect Antoine Predock won. His attention to surrounding landscape and use of stony material with interesting geometries played a major role in the choice of his design. The design features a cliff-like tower clad in local Tyndall limestone, alongside a 7,000-square-foot atrium winter garden, enclosed by a south-facing swoop of glass paneling. It is then topped by a 100-meter-tall crystalline tower. Framing the entrance are four massive berms, three planted with prairie sweetgrass, one stepped into an amphitheater (de Monchaux, 2015). To say this monument of a building is a defining focal point for Winnipeg would be an understatement. Not only does its unique shape give it a distinct place in the Forks region, but its use of light creates a dynamic environment around it, even in the winter. However, even though it is a defining monument, it still has a sense of place by using local materials, using the landscape for its its shape, and designing elements based on the climate.

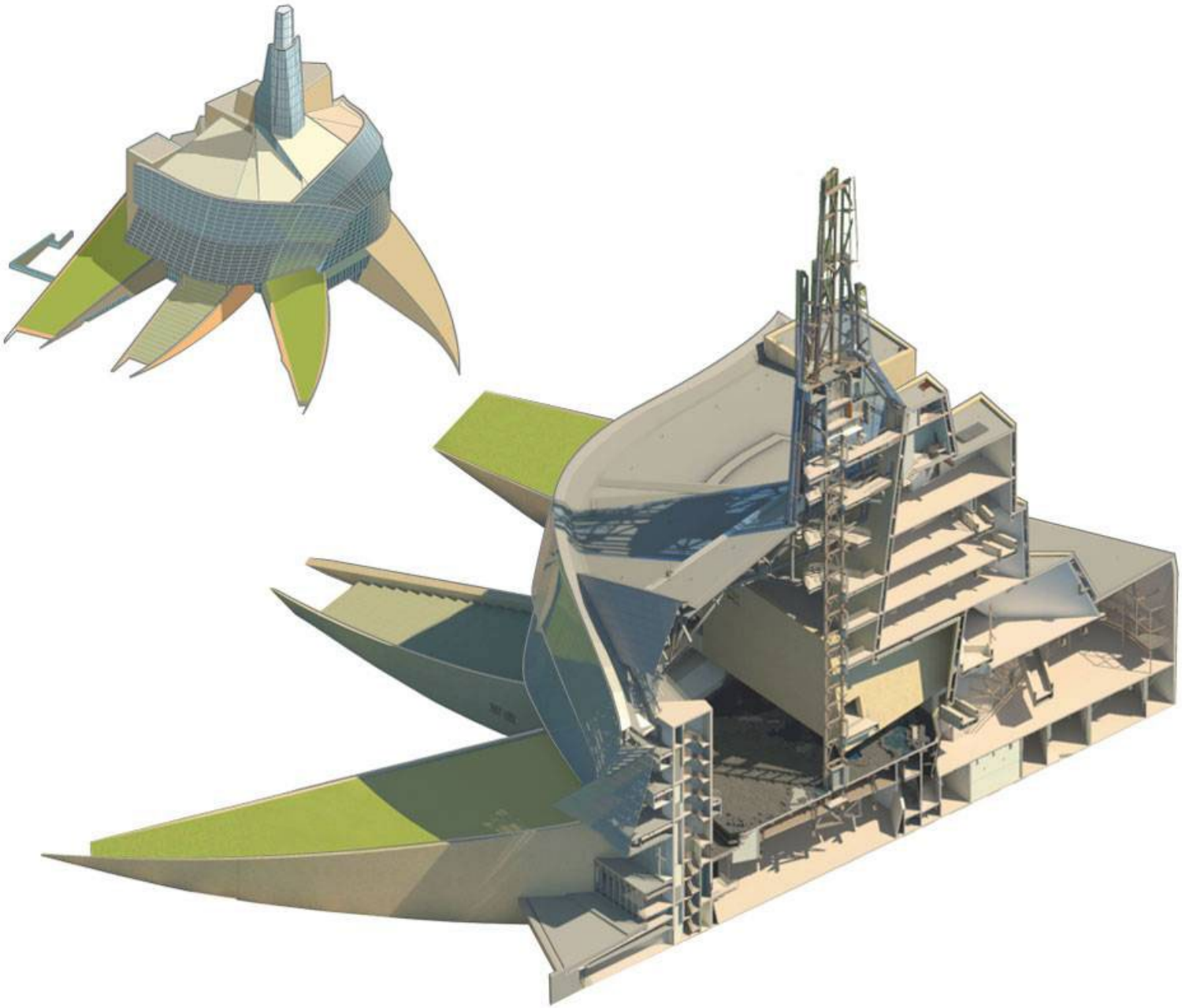


Figure 63.1

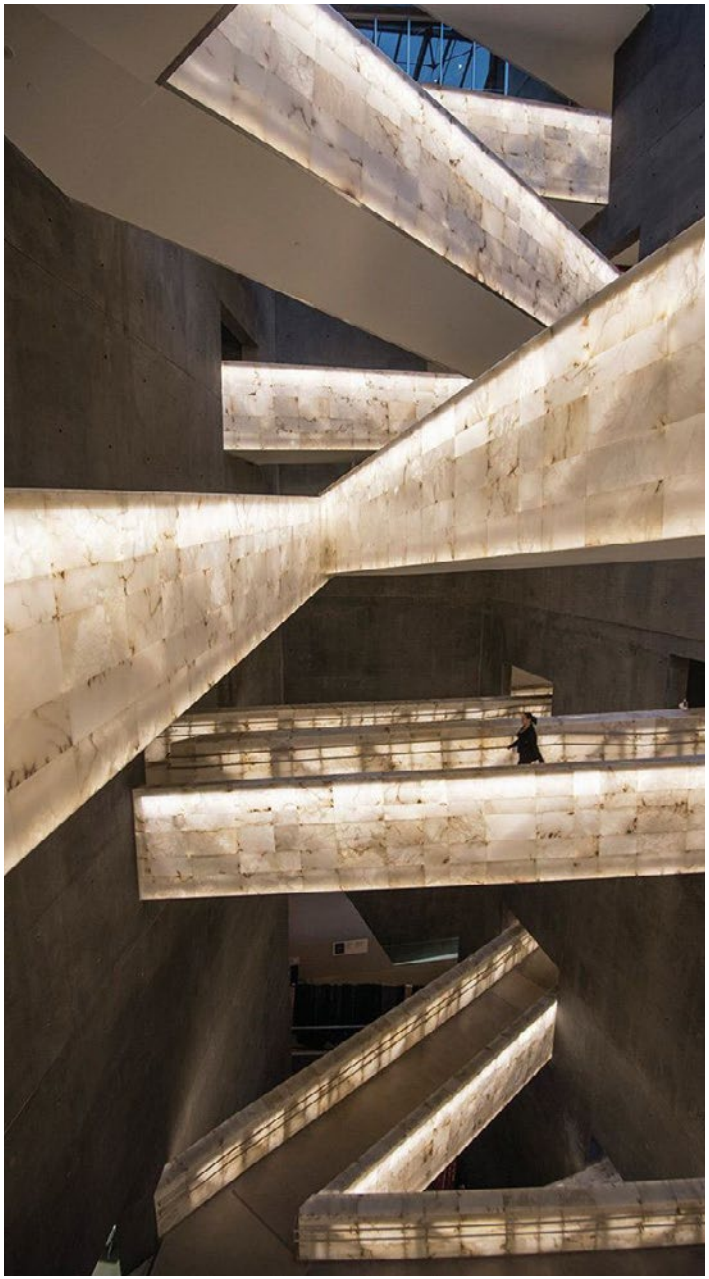


Figure 64.1

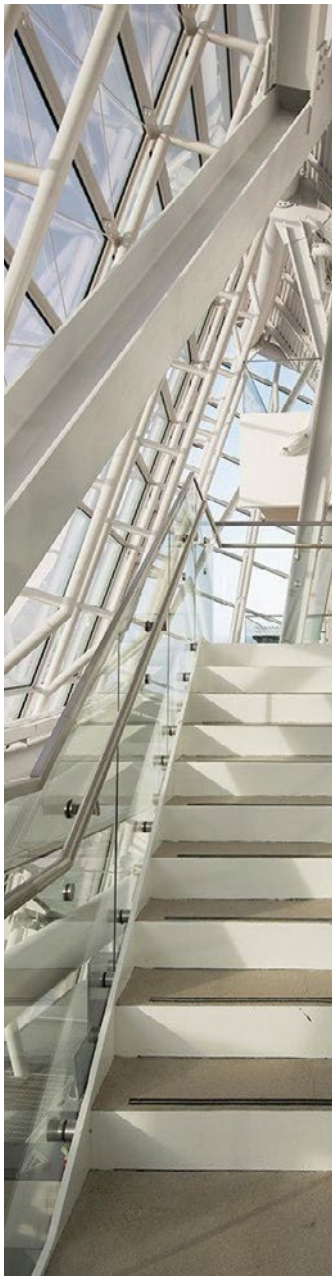


Figure 64.2

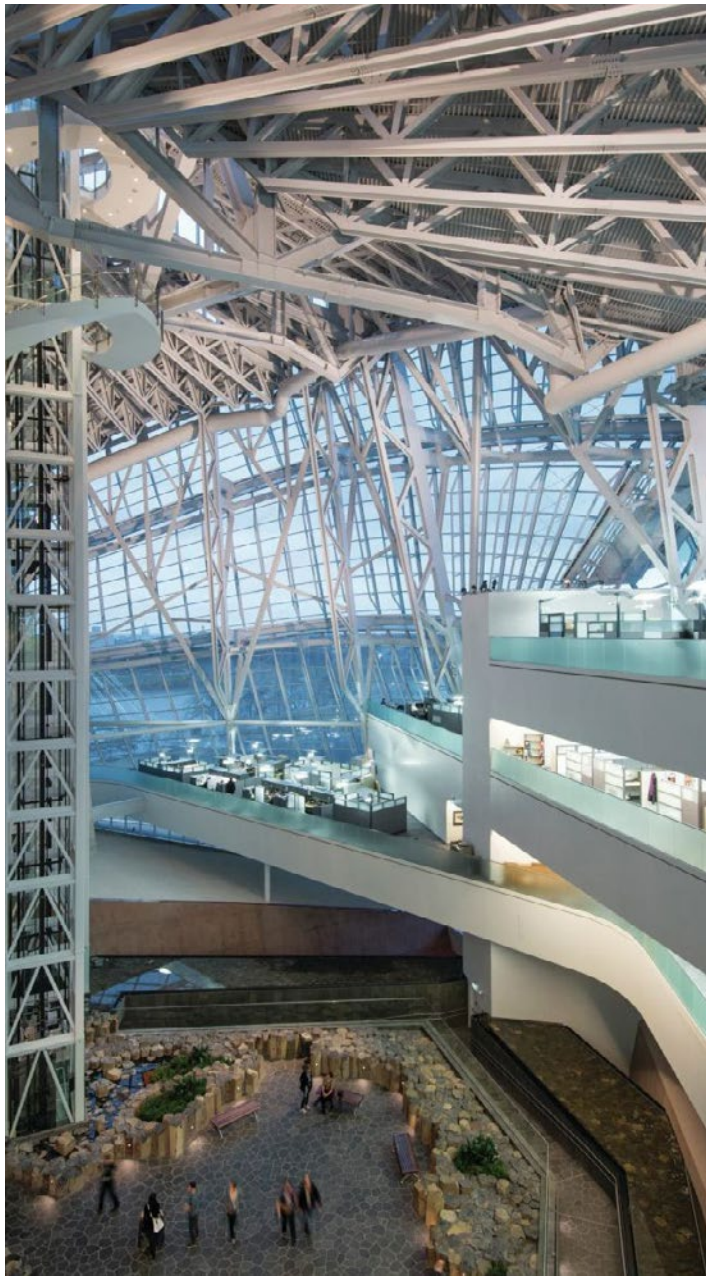


Figure 64.3

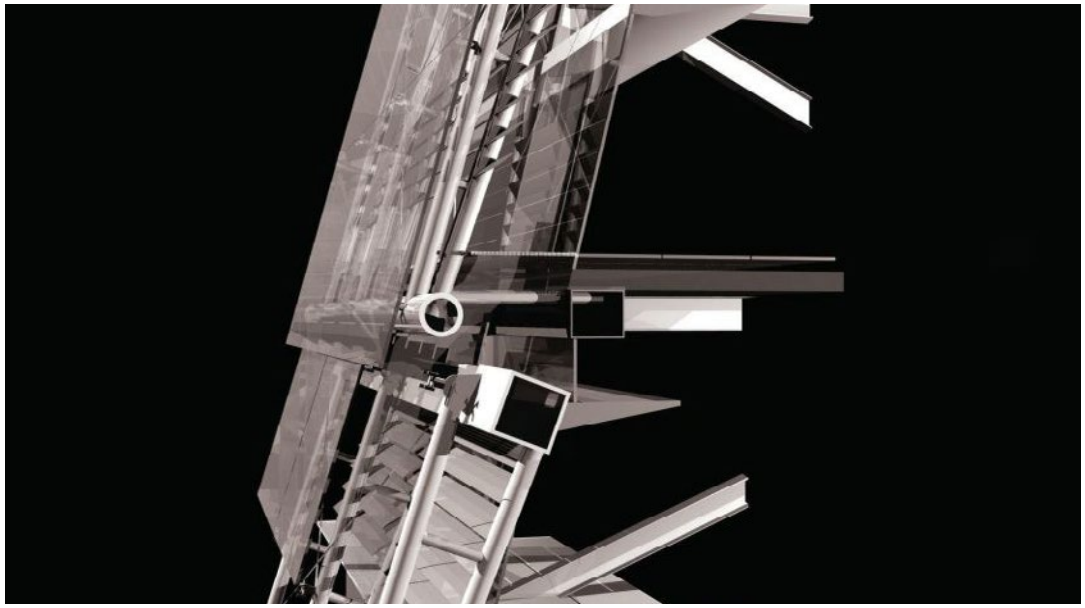


Figure 65.1

The curving glass curtain wall system that encloses the museum was developed to help deflect wind patterns and lighten the lateral load on the structural members. An interior layer of glazing is formed from insulated glass units with low-E coatings, and operable windows at each level allow for ventilation. Intake dampers are located at the points where the glass overlaps, and allow for hot air to be exhausted from the cavity between the glazing layers, regulating temperature and insulating the structure.

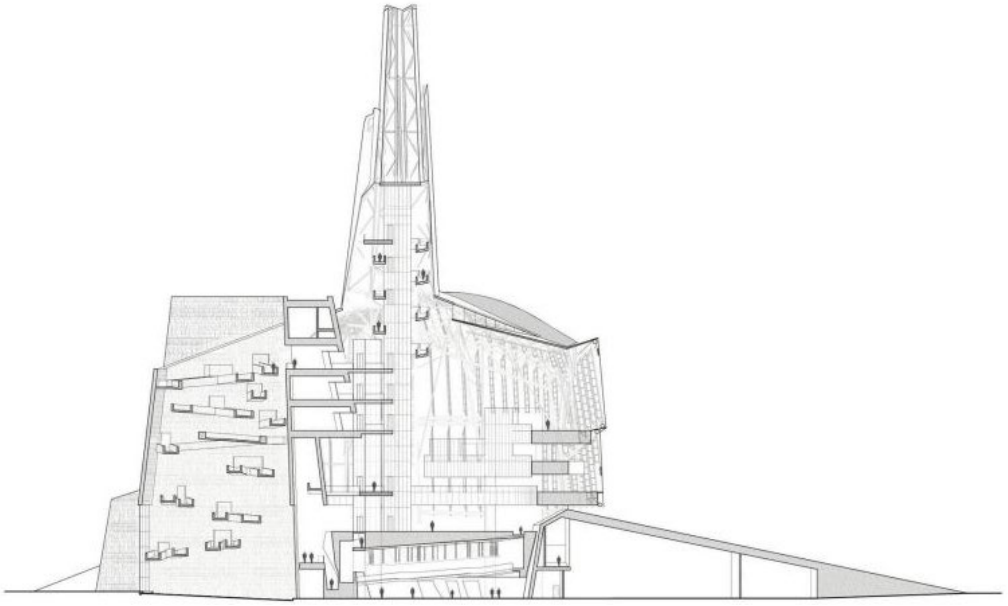


Figure 65.2

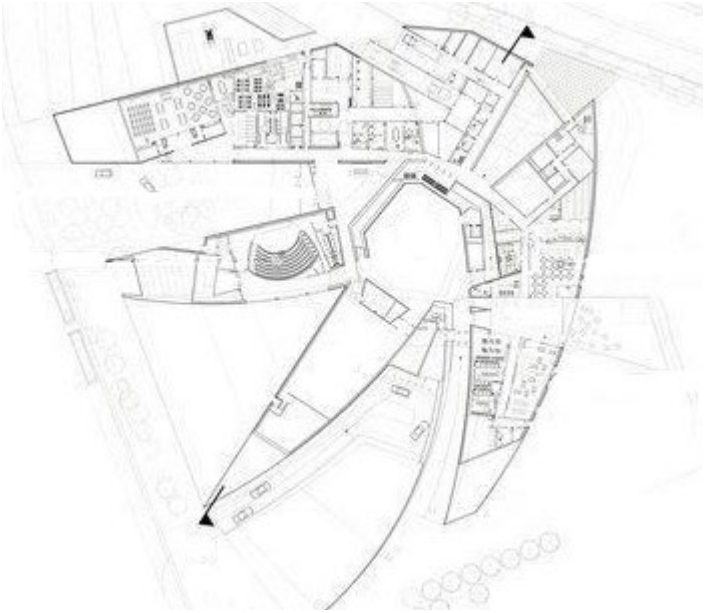


Figure 65.3

Figure 66.1

Site Visit

This semester, I had the opportunity to visit The Forks. I observed park-goers hourly to see where people were within the park, determining the areas with high activity. The image on the right shows where those areas of activity were. I concluded, through observation, that people are attracted to the river, areas of high interest (such as a museum), and outdoor activity (such as sledding hills). The line of travel I took to create the panoramic images I also used to analyze the area is marked on this image. The panoramic images are on the next pages.

1. Canadian Museum for Human Rights
2. Sledding Hills (very popular with families)
3. Parking
4. Market Place (indoor shopping center)
5. Skating Areas (including river)

High Amounts of Human Activity

Figure 67.1

Panoramic Analysis

I analyzed an area in the Forks through panoramic images, trying to determine why people experienced this place during winter. I concluded that areas with high transparency, dynamic lighting, and breaks in a building facades attracted the most amount of people.

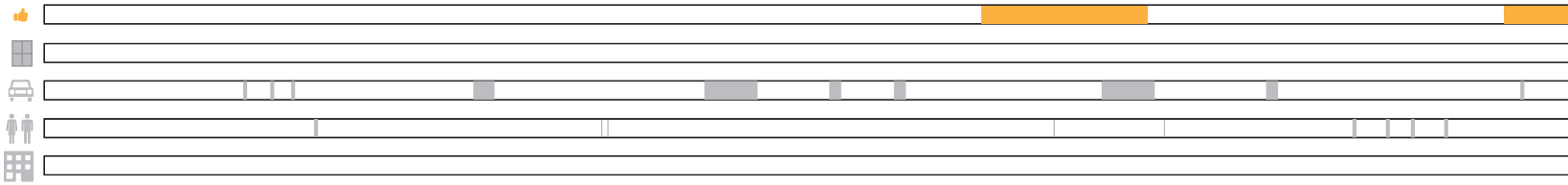


Figure 69.1

Figure 69.2

Figure 70.1

The Forks Conclusion

This region is a perfect example of a successful public space that creates better human interaction. Its many features and buildings, and, more importantly, the fact that it is successful all year long make it a perfect place to emulate within my design. Not only that, but also the fact that it is actually colder in Winnipeg than Grand Forks, and the cities are along the same river as well.

One major aspect I can take from the Forks is how they celebrate the river, and use the land adjacent to it to their best advantage. They use the river all year long, creating a natural skating attraction in the winter when it freezes over. Many events also happen near the river during winter, such as a New Year's Eve celebration shown on the left, as there is an amphitheater close by with ample room for crowds.

Another great aspect of this place is the connection with nature the built elements have. Even though most buildings are historically from the rail yard days of this site, they are situated in a way that create comfortable outdoor spaces that are easily connected to the green space of the Forks. They have essentially made outdoor "living rooms" where one can transition between indoors and outdoors with ease.

This public "living room" idea also permeates into the buildings as well, exemplified in the new Market Food Hall. This newly renovated space creates a highly flexible area for people to gather and eat.

Food can be a great means to evoke human interaction, and creating a space that is open and flexible can enhance this as well. I believe that it would be a good idea to include a large food hall in my design; one that becomes a public "living room" for the Grand Forks area. Some other things to take from this design is the fact that they used the industrial context very well, and also created a visually warm space that also uses a lot of natural light.

I can also use a lot of aspects from this site in the Canadian Museum for Human Rights. Its use of local materials and using the landscape surrounding it for its form are great points to use when creating a sense of place. I also think I can learn from this museum by creating a monumental building for Grand Forks that gives the downtown area a focal point, and destination. The museum's use of light is also very good for cold, dark nights in winters, and it's facade system is a very interesting system to look into further to details in my buildings. One last aspect I found interesting within the building is the winter garden, which could be a nice alternative to an exterior garden for the winter months.

Figure 72.1

Precedent Analysis: Birch Hill Ski Building

LOCATION Fairbanks, Alaska
DESIGNER David Hayden
TYPE Recreation/ Assembly
SIZE 11,175 ft²
COMPLETION 2003

The Birch Hill Ski Building resides in the Birch Hill recreation area, a world-class facility where Nordic ski teams from the United States and other countries compete and train, a few mile northeast of Fairbanks. This area contains miles of cross-country trails, including six miles of lighted trails for night skiing. Competitive cross-country skiers believe the area has the best early season snow in the U.S., even in Fairbanks where temperatures can dip to -65°F.

The design consists of two pods, one for services and one as a gathering and warming space. The service pod contains an entryway, elevator, stairway, waxing areas, changing rooms, and bathrooms. This pod is clad in galvanized metal, whereas the warming pod has cedar wood siding, giving it a warmer feel. The pods are connected to each other by a viewing bridge that spans over the incoming ski trail.

The wood structure is revealed both on the exterior of the bridge and the interior of the gathering space, creating a rustic character commonly associated with ski venues. The material and color selection provides a bright and colorful backdrop to the white of winter. From the interior, there are views out to the slopes and trials, and it provides a beacon for skiers in the darkness (Decker, 2010).

Figure 73.1

Figure 73.2

Figure 73.3

Figure 74.1

Birch Hill Ski Building Conclusion

Some of the aspects that can be taken from this building into my design are the choice of materials, the design concept and layout, and the building type. I believe that the building materials work really well with the surrounding context and adds color to the otherwise white landscape. I enjoy the idea of bridging to “pods” as well. This idea could be utilized in my design as a way to bridge over the existing dike system of Grand Forks, or roads. I also believe a building of this type would work really well connected to the Greenway system in Grand Forks, thus creating trails for skiing and a warming place for the residents who decide to use them.

PROCEDURE

Problem Statement

Function

Since creating multiple uses within a neighborhood increases pedestrian activity and there is a lack of families living in downtown Grand Forks, **the design must incorporate a mixture of uses that focus around family housing.**

Since outdoor activities need to be emphasized to create a more vibrant outdoor space during the winter months, **the design should have a space dedicated to these activities.**

Since there is a lack of indoor community space, **the design should have a large assembly area for neighborhood gatherings.**

Economy

Since funds can be limiting in local government ventures such as this one, **an emphasis on functionality should be present within the design.**

Since there must be an emphasis on materiality and a natural connection within the design, **there must also be a high level of design with its functionality.**

Form

Since visually warm environments invite users to experience a neighborhood, **the design must use materials that have attributes that create these environments.**

Since there is a need to create building that work with the environment and look like they belong within their context, **the design must have buildings that can withstand a harsh climate, that are aerodynamically shaped against the wind, and have shapes create comfortable microclimates.**

Since resident activity level is very low in the winter, **the design must create an environment that allows easy access to nature and takes emphasis off of vehicular traffic.**

Time

Since the design is focused on a particular part of the neighborhood, **it must be considered as a small part of a bigger master plan to create a more vibrant city during the winter. The ideas behind this particular design should also serve as an example for other cold climate cities.**

Space List: Mixed-Use Family Housing

Downtown Grand Forks has the potential to create housing specifically catered to families. The high school that is located in downtown, and the elementary that is located within a 5 block radius of downtown will provide easily accessible schooling for children. There is also a high amount of office buildings in the area for parents to work. This specific building will provide housing for them, provide a child care facility, and create areas for activities. The communal space will also be available to rent for events, and the meeting room will provide public space for people to meet as well.

Area/Type	Function	People	Capacity	Number of Units	Area/Unit	Net Area	Net Area Subtotals
Apartment Unit A							
	Master Bedroom	2		1	200	200	
	Walk-In Closet			1	25	25	
	Bathroom			2	40	80	
	Living Space/Kitchen			1	500	500	
	Bedroom	1		1	135	135	
	Closet			2	15	30	
	Laundry Closet			1	30	30	
Unit A Total		3		1		1000	
Subtotal		45		15			15000
Apartment Unit B							
	Master Bedroom	2		1	200	200	
	Walk-In Closet			1	25	25	
	Bathroom			2	40	80	
	Living Space/Kitchen			1	550	550	
	Bedroom	2		2	135	270	
	Closet			3	15	45	
	Laundry Closet			1	30	30	
Unit B Total		4		1		1200	
Subtotal		60		15			18000
Entrance Space							
	Mail Room		2	1	50	50	
	Manager Office	1		1	175	175	
	Front Desk	2		1	220	220	
	Entry		10	1	675	675	
Subtotal		3	12				1120
Communal Space							
	Kitchen		5	1	250	250	
	Dining Space		25	1	375	375	
	Workout Room		12	1	600	600	
	Gaming Space		15	1	400	400	
	Meeting Room		15	1	225	225	
	Soft Seating Area		10	1	300	300	
	Men's Restroom		3	1	75	75	
	Women's Restroom		4	1	100	100	
Subtotal			89				2325
Utility							
	Elevators		5	2	25	50	
	Stairs/Egress			8	40	320	
	Janitor Storage		2	1	150	150	
	Mechanical Space					3000	
Subtotal			7				3520

Day Care Center							
	Play Area		17	1	625	625	
	Office	1		1	175	175	
	Kitchen/Staff Lounge	2		1	250	250	
	Storage			1	50	50	
	Restroom		1	1	25	25	
Subtotal		3	18				1125
Retail							
	Retail Space		16	4	1000	4000	
Subtotal			64				4000
Total							45090

Table 80.1

Space List: Winter Activities Center

The Winter Activities Center will provide easy access to outdoor activities during the winter months. It will be situated next to the Greenway, and connected to cross country ski trails. It will also be accessed by the Town Square, where there will be a skating rink. It will be an extension building of the YMCA, which is located 5 blocks away.

Area/Type	Function	People	Capacity	Number of Units	Area/Unit	Net Area	Net Area Subtotals
Administration							
	Office	2		2	175	350	
	Breakroom	4		1	400	400	
	Storage			1	50	50	
Subtotal		6					800
Rental Area							
	Storage			1	200	200	
	Changing Area		10	1	75	75	
	Rental Desk		2	1	220	220	
Subtotal			12				495
Locker Area							
	Men's Locker		10	1	500	500	
	Women's Locker		10	1	500	500	
	Sauna		5	1	45	45	
Subtotal			25				1045
Warming Space							
	Warming Area		15	1	450	450	
	Men's Restroom		3	1	75	75	
	Women's Restroom		4	1	100	100	
Subtotal			22				625
Utility							
	Elevators		5	2	25	50	
	Stairs/Egress			4	40	160	
	Janitor Storage		2	1	150	150	
	Mechanical Space					300	
Subtotal			7				660
Total							3625

Table 80.2

Space List: Market Food Hall

The Market Food Hall will provide a gathering space for residents of the area to interact with the community and enjoy a good meal.

Area/Type	Function	People	Capacity	Number of Units	Area/Unit	Net Area	Net Area Subtotals
Food Vendors							
	Stall with Kitchen	4		4	800	3200	
	Stall without Kitchen	4		2	300	600	
	Bar	2		1	220	220	
	Coffee Bar	2		1	220	220	
Subtotal		28					4240
Assembly Space							
	Dining Area		50	1	1200	1200	
	Soft Seating		20	1	300	300	
	Men's Bathroom		6	1	150	150	
	Women's Bathroom		7	1	175	175	
Subtotal			83				1825
Utility							
	Janitor Storage		2	1	150	150	
	Mechanical Space					600	
Subtotal			2				750
Total							6815

Table 81.1

Building Area Summary

Space Name	People	Capacity	Net Area	Net:Gross	Gross Building Area
Mixed-Use Family Housing					
Apartment Units A	45		15,000	68%	22,059
Apartment Units B	60		18,000	68%	26,471
Entrance Space	3	12	1,120	100%	1,120
Communal Space		89	2,325	63%	3,690
Day Care Center	3	18	1,125	58%	1,940
Retail		64	4,000	88%	4,545
Utility			3,520	100%	3,520
Subtotal	111	183			63,345
Winter Activities Center					
Administration	6		800	62%	1,290
Rental Area		12	495	63%	786
Locker Area		25	1,045	68%	1,537
Warming Space		22	625	63%	992
Utility			660	100%	660
Subtotal	6	59			5,265
Market Food Hall					
Vendor Areas	28		4,240	58%	7,310
Assembly Space		83	1,825	63%	2,897
Utility			750	100%	750
Subtotal	28	83			10,957

Table 81.2

Land Use Requirements

The three buildings will be located on two sites that are situated along the Greenway and across Demers Avenue from each other. There are three existing features on these sites that I will preserve: the Town Square, the amphitheater on Town Square, and the pumping station. There will also be a parking ramp connected to the Mixed-Use Family Housing building to provide parking to all of these amenities, and to replace the parking that will be lost.

Land Use Area	People	Gross Building Area	Floors	Building Footprint	GAC	Land Area	Additional Info
Site 1							
Winter Activities Center							
Building	6	5,265	1	5,265	8%	67,237	
Parking							
Staff	6	2,280					
Visitors	59	22,420					
Parking Totals	65	24,700					Use parking on site 2
Market Food Hall							
Building	28	10,957	1	10,957	16%	67,237	
Site Facilities							
Town Square			1	17,050	25%	67,237	Existing
Ampitheater				4,200	6%	67,237	Existing
Parking							
Staff	28	10,640					
Visitors	83	31,540					
Parking Totals	111	42,180					Use parking on site 2
Site 2							
Mixed-Use Family Housing							
Building	111	63,345	5	12,669	25%	49,950	
Site Facilities							
Pumping Station			1	1,120	2%	49,950	Existing
Parking							
Residents/Staff	111	42,180					
Day Care	18	6,840					
Retail Visitors	64	24,320					
Communal Space Visitors	89	33,820					
Parking Totals (Site 2)	282	107,160					
Parking Totals (Site 1)	176	66,880					
Parking Totals	458	174,040	5	34,808	70%	49,950	

Table 82.1

Spatial Relationship Diagram

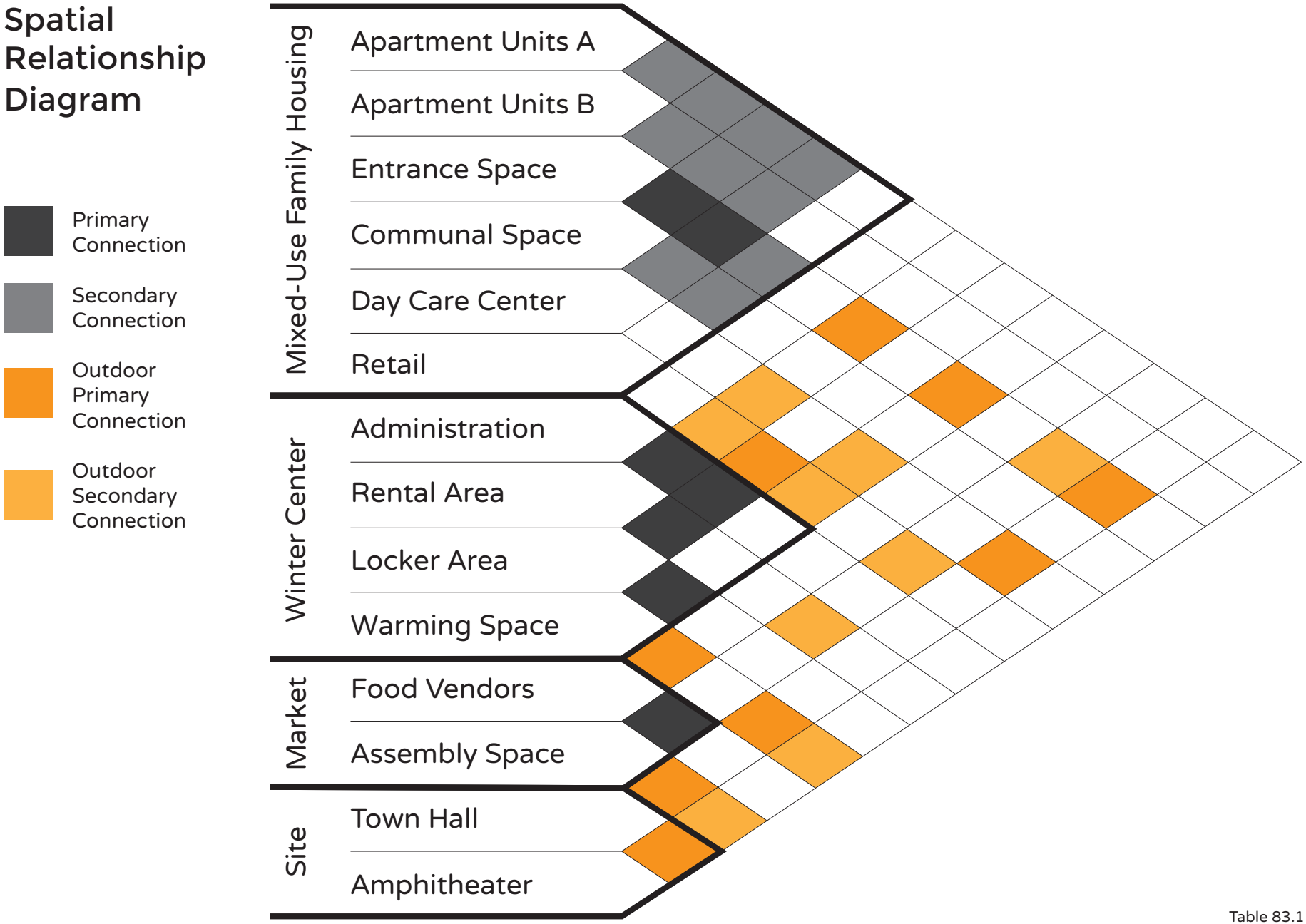


Table 83.1

Spatial Relationships Site 1: Intersection of Demers and 3rd

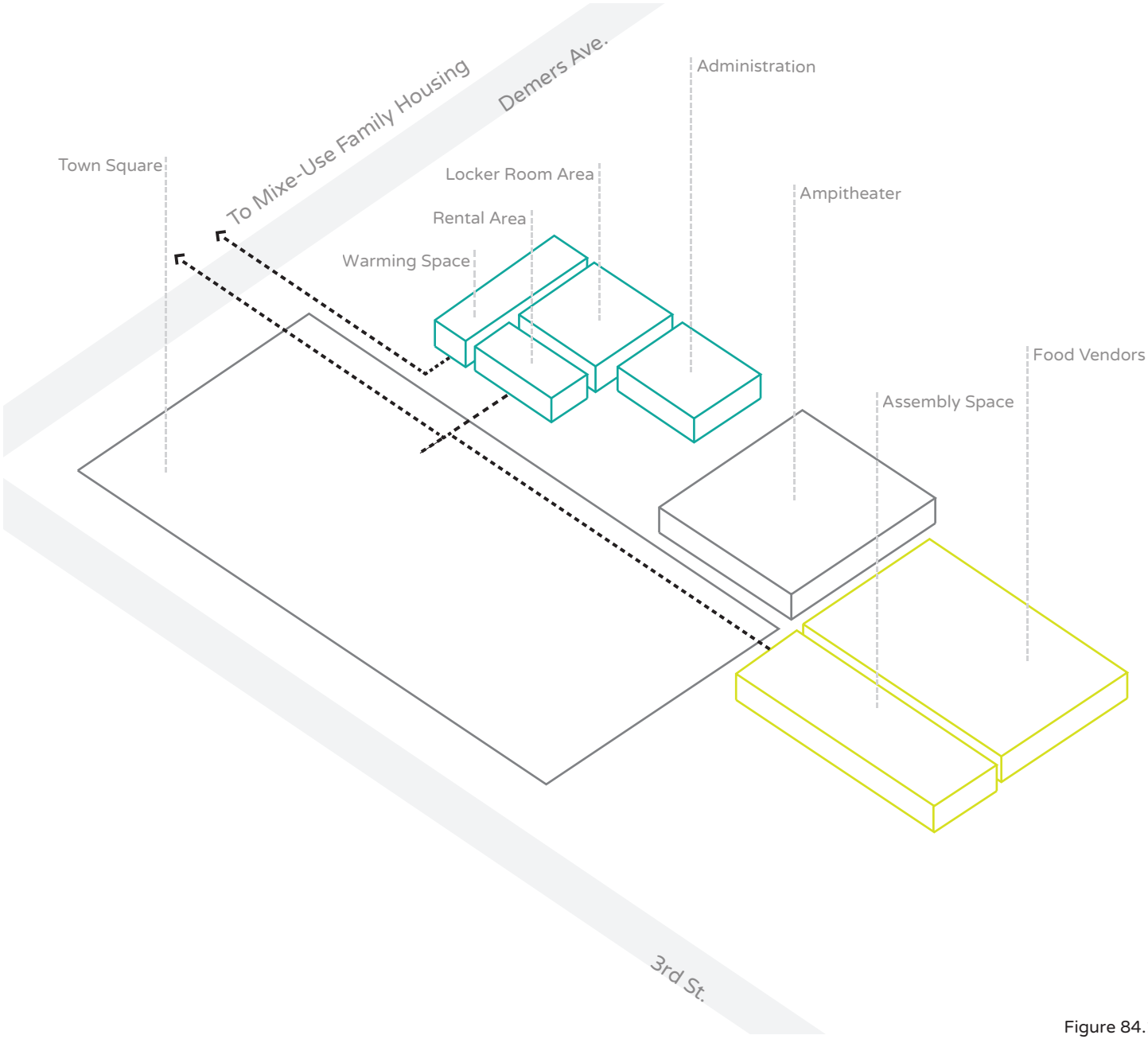


Figure 84.1

Spatial Relationships Site 2: 216 Demers Level 1

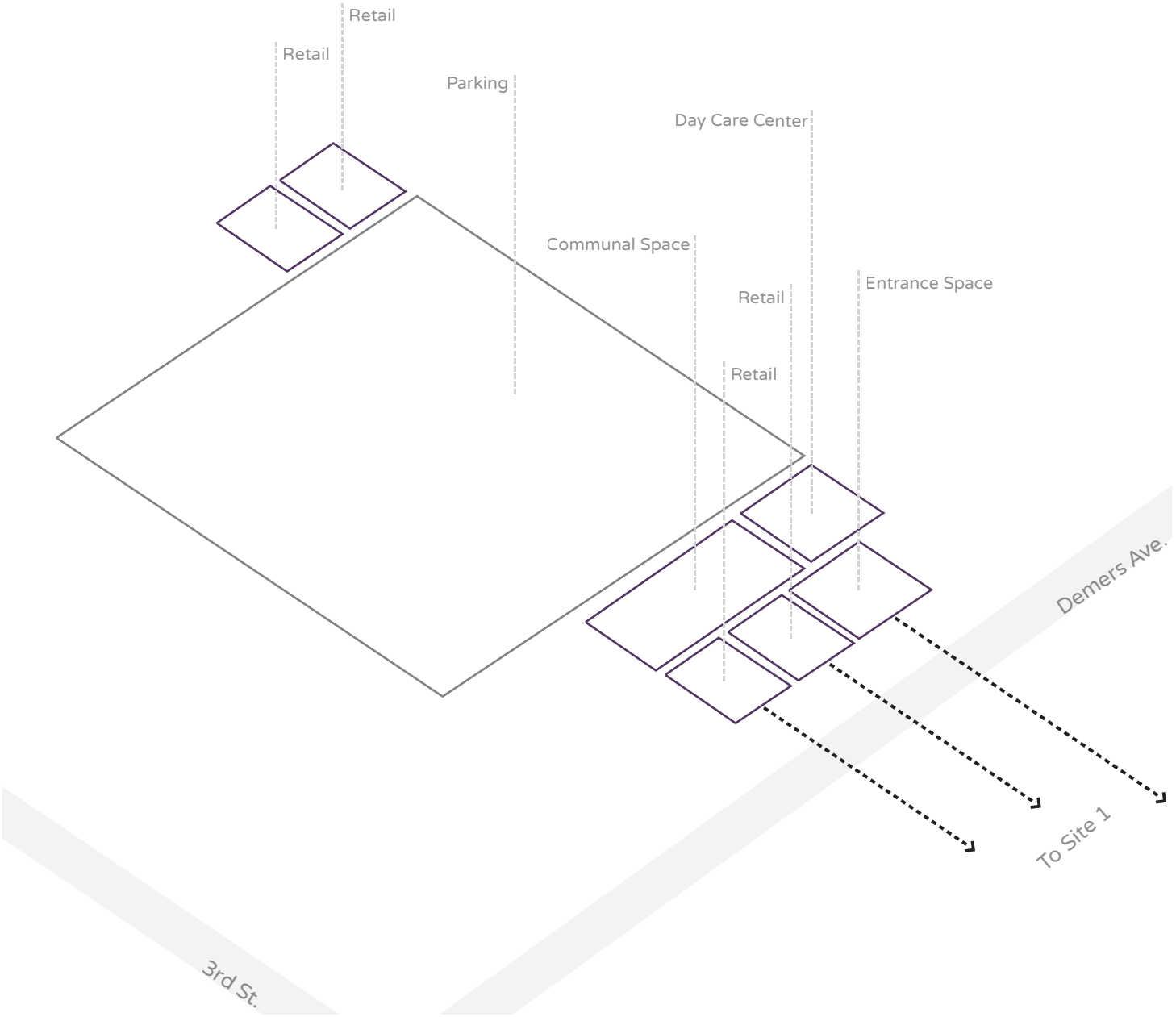


Figure 85.1

Design Process

My design process will consist of four portions: research, predesign, design development, and final design.

Portion 1: Research

The research portion of my thesis design process will consist of six phases. I will start by researching psychological and physical elements to my design. The psychological elements to my design may delve into the areas of perception, human comfort, and isolation. I will then take this research and analyze it through artifacts that may look deeper into people's perceptions of warmth in the areas of materiality, color, and light. The physical research into my design will look at building forms that create more comfortable surrounding environments. This research will then be realized in preliminary forms during the predesign portion of my process.

During the predesign portion, I will also analyze previous projects to aquire knowledge of elements that have worked in the past. I will also focus on each individual building during this time, researching information on each typologies.

Once I have completed mid-term reviews I will analyze the feedback I will recieve and use it to address needs within my design that were not met.

Portion 2: Predesign

The predesign portion will consist of three phases. Preliminary forms will be created, with many iterations, from the research into the physical aspects of creating more comfortable environments. The placement of all building and elements into the site will also take place during this portion. After researching into precedence and typology, the form and function of each building will be developed as the last phase of predesign.

Portion 3: Design Development

The design development portion will consist of four phases. The first phase will progress the form and function by focusing on detailing the building layout. Once the inside of the building is detailed, I will focus on the exterior details, with and emphasis on materials. The materiality of the design will be based on the psychological research I will have accomplished earlier in the process.

Site design will be the third phase of design development. This phase will be very important because of my typology, which is urban design. This phase will look at how to connect each of the buildings I have deigned, and to make a cohesive sector of the downtown Grand Forks area.

Once I have completed mid-term reviews and have analyzed the feedback given, I will then redesign if need be.

Portion 4: Final Design

The final design portion of my design process will consist of four phases that will each focus on creating a high quality, professional thesis presentation. I have given myself enough time in this portion to allow for the possible redesign of my project based on mid-term reviews.

The first phase is to make a physical and digital context model of downtown Grand Forks to give my project place, This will be done during the design development time period to allow for more time for rendering and presentation preparation.

Three phases that will be happening simultaneously will be final design, rendering, and tech drawings. These will all be combined into the final presentation boards. I will also allow myself a week to set up.

Design Methodology

The methodologies I will be pursuing in my process will be descriptive research and modeling research. Both of these research methods will use real world examples and models to obtain information needed to further my thesis project.

I will be using descriptive data, such as scholarly articles on human interaction or case studies of cold climate neighborhoods and buildings, to analyze different aspects of my design. One major aspect of my design is human interaction and comfort. I will analyze psychological articles and research into human comfortability and the correlations to interaction with others. I will also look into sociological aspects of human interaction within a city and the benefits it has on individuals. Another major aspect of my thesis is cold climate design. I will research and analyze case studies of winter neighborhoods and designs. I will then take the information from these and determine what is successful and unsuccessful in these projects to take into my design.

I will also be using modeling as a research methodology as well. I will model many different iterations of potential building forms to determine what form is that best for the area in terms of winter wind protection, maximizing sun exposure, and creating comfortable micro climates. In addition to modeling building forms, I will also be looking into building materiality and lighting. This will be modeled through artifacts made to evoke different feelings in viewers to determine materials that have a sense of warmth.

Documentation

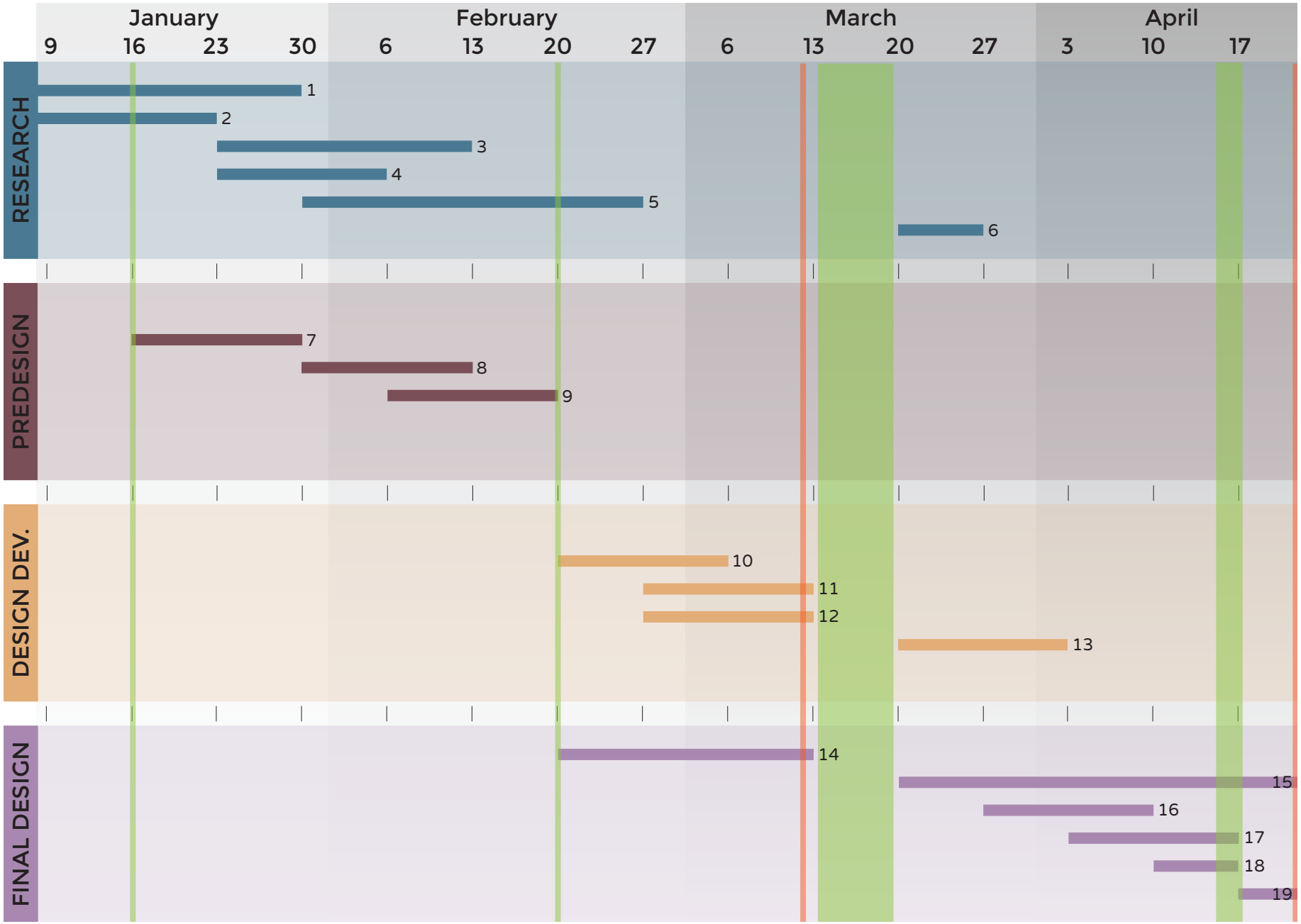
The documentation of this process will take place weekly through submittals given to my thesis advisor. Files will be organized within the four main portions of my process, and subdivided by each parts, as stated before. These files will be named according to those parts and date of creation.

Design Schedule

Schedule on page 89.

Process:
1. Psychological Research
2. Physicality Research
3. Artifact
4. Precedent Analysis
5. Typology Research
6. Feedback Analysis
7. Preliminary Forms
8. Site Placement
9. Form/Function
10. Building Layout
11. Materiality
12. Site Design
13. Redesign
14. Context Model
15. Presentation
16. Final Design
17. Rendering
18. Tech Drawings
19. Set Up

Important Dates/Holidays:
Jan. 16/MLK Jr. Day
Feb. 20/Presidents' Day
Mar. 10/Midterm Reviews
Mar.11-19/Spring Break
Apr. 14-17/Easter Weekend
Apr. 21/Thesis Due


January
February
March
April
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16
23
30
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13
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27
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27
3
10
17
RESEARCH
1
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PREDESIGN
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DESIGN DEV.
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FINAL DESIGN
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Figure 89.1

DESIGN

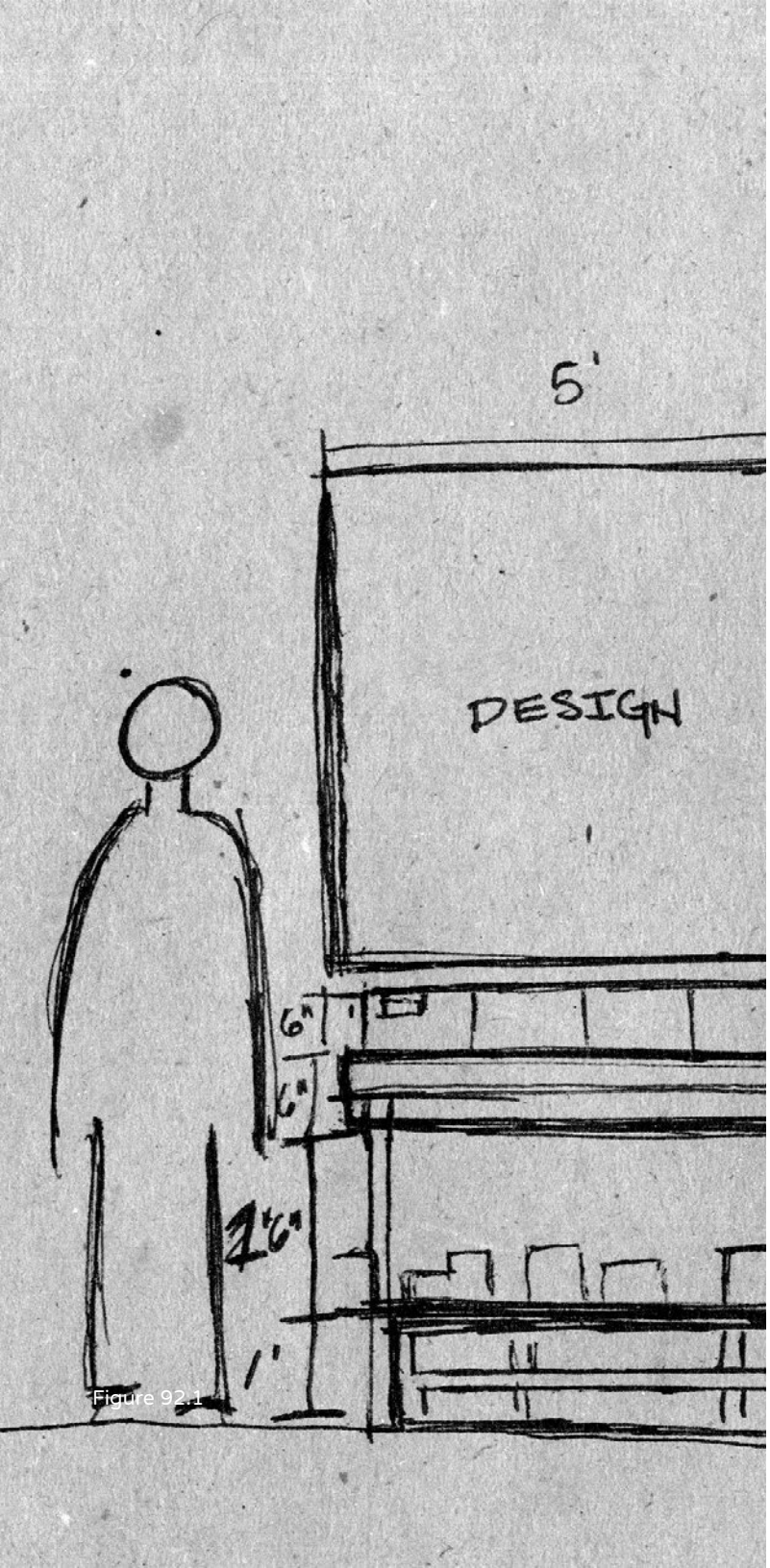


Figure 92.1

Process Documentation

The design process took me through many iterations of modeling, sketching, and digital design. There were many facets of my project in which to explore, which led to many different ways of organizing my site.

I decided that this design issue was better met with a solution that would include the whole site, and not just three specific buildings. Taking this new-found idea, I decided to work my way through the process from the top down, focusing more on urban design.

Figure 93.1

Preliminary Process

My preliminary process focused on specific sites within Downtown Grand Forks to find a solution to the problem with the specific space data I was researching during the first semester. While still trying to find a specific site, I narrowed my search to what is now my site: the eight blocks surrounding Demers Avenue.

Figure 94.1

Figure 94.2

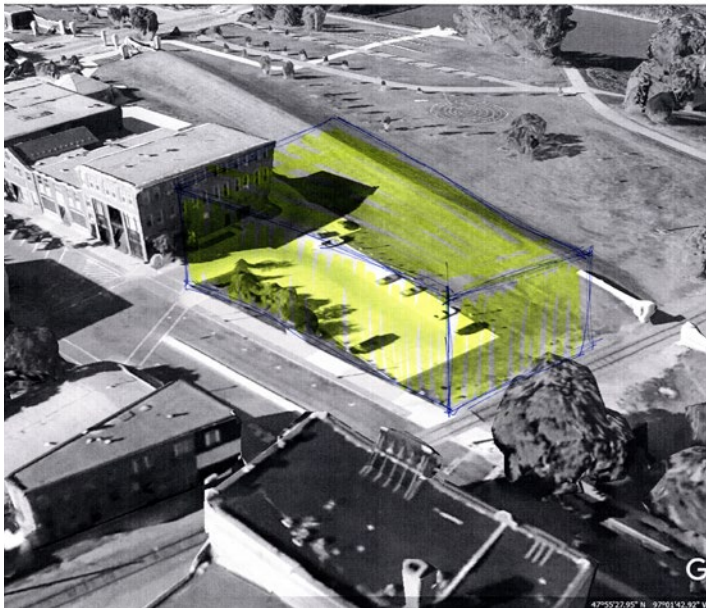


Figure 94.3

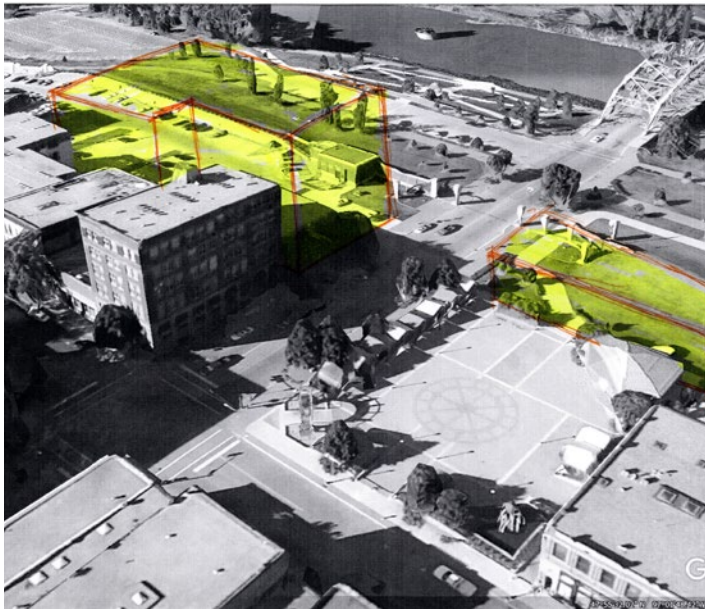


Figure 94.4

Masterplan Process

While narrowing my site, I realized that I need to stray away from choosing a specific site and look at the bigger picture. I choose then to make a masterplan of my entire site along Demers Avenue. Using my site analysis and research, I chose the best sites and building forms through modeling and sketching. At first I tried to break up the site in five different parts, but then quickly realized that I needed to take a holistic approach to the solution.

Figure 95.1

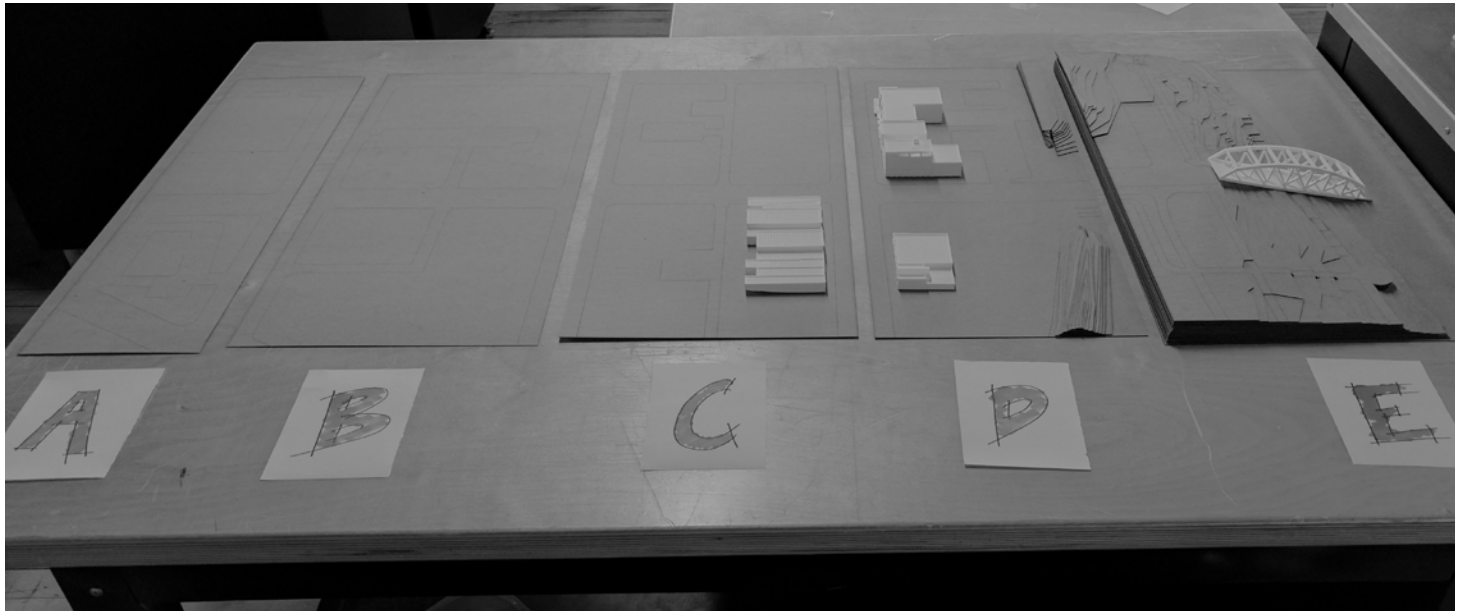
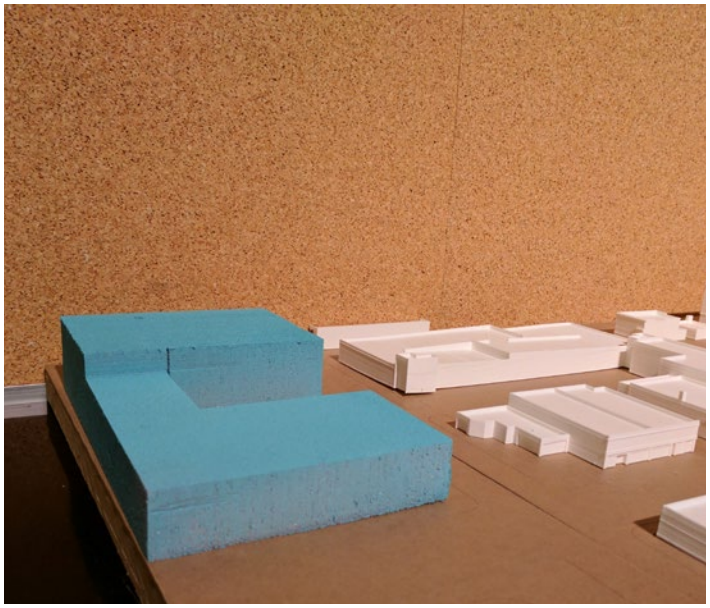


Figure 95.2



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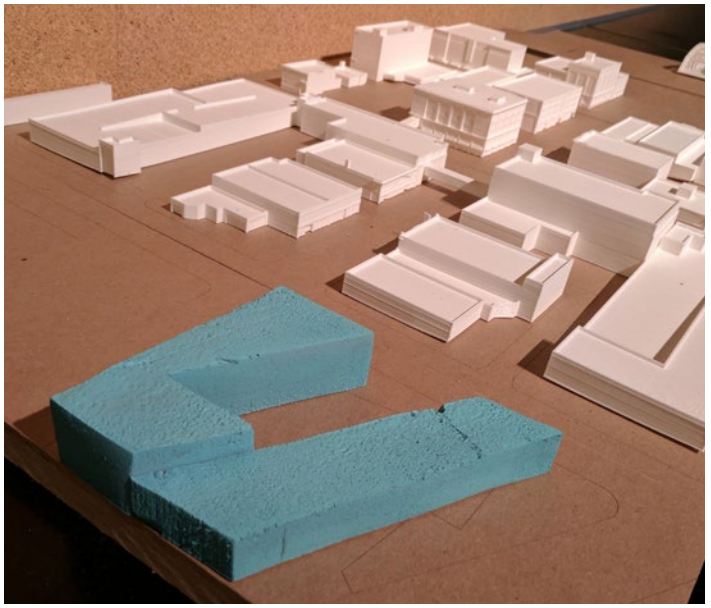
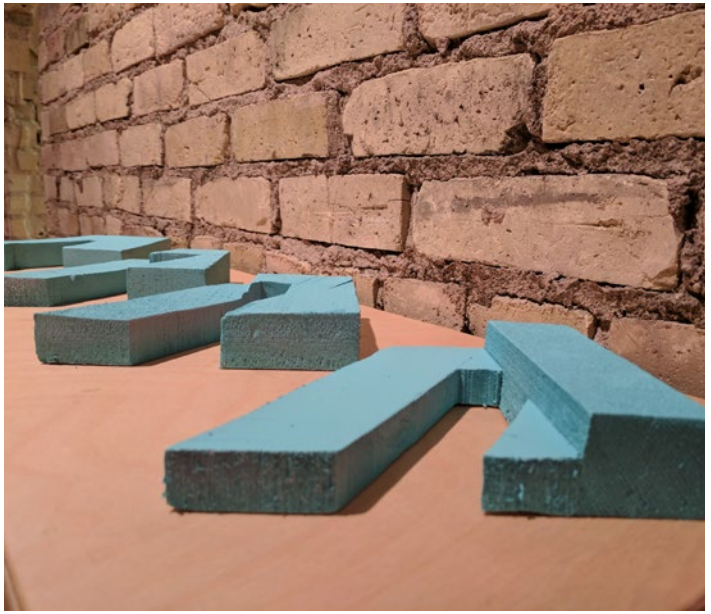


Figure 96.2

Figure 96.3



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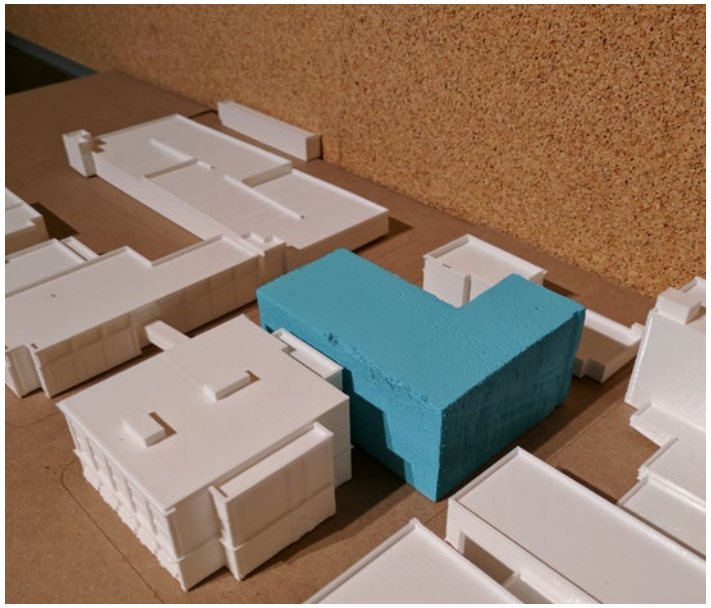

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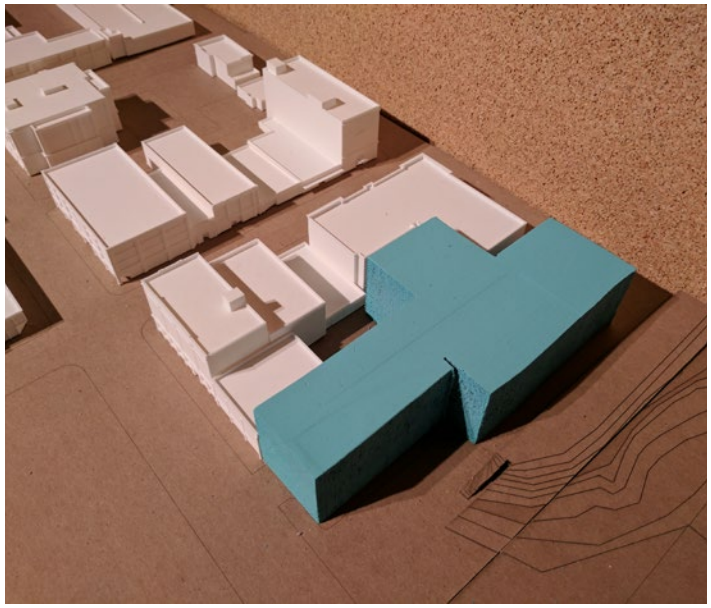

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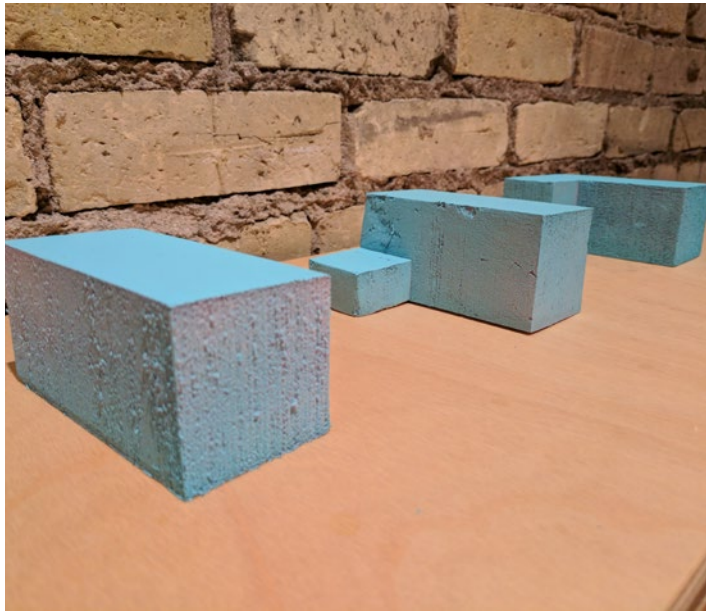

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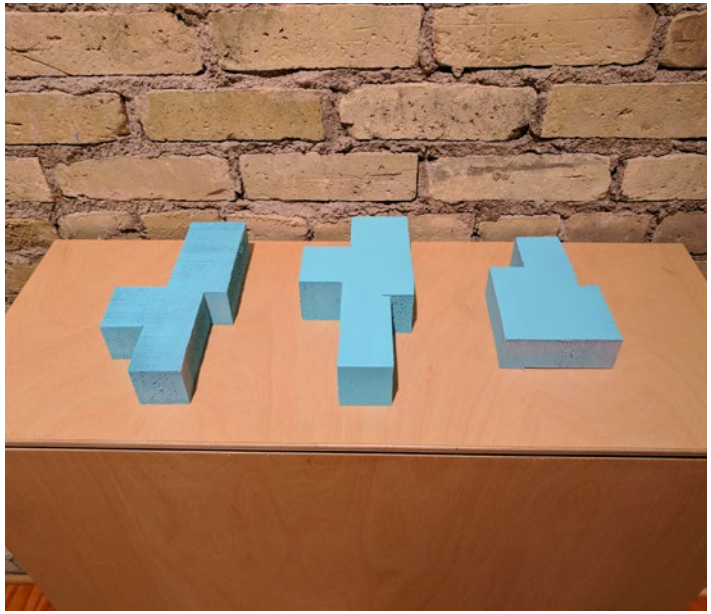

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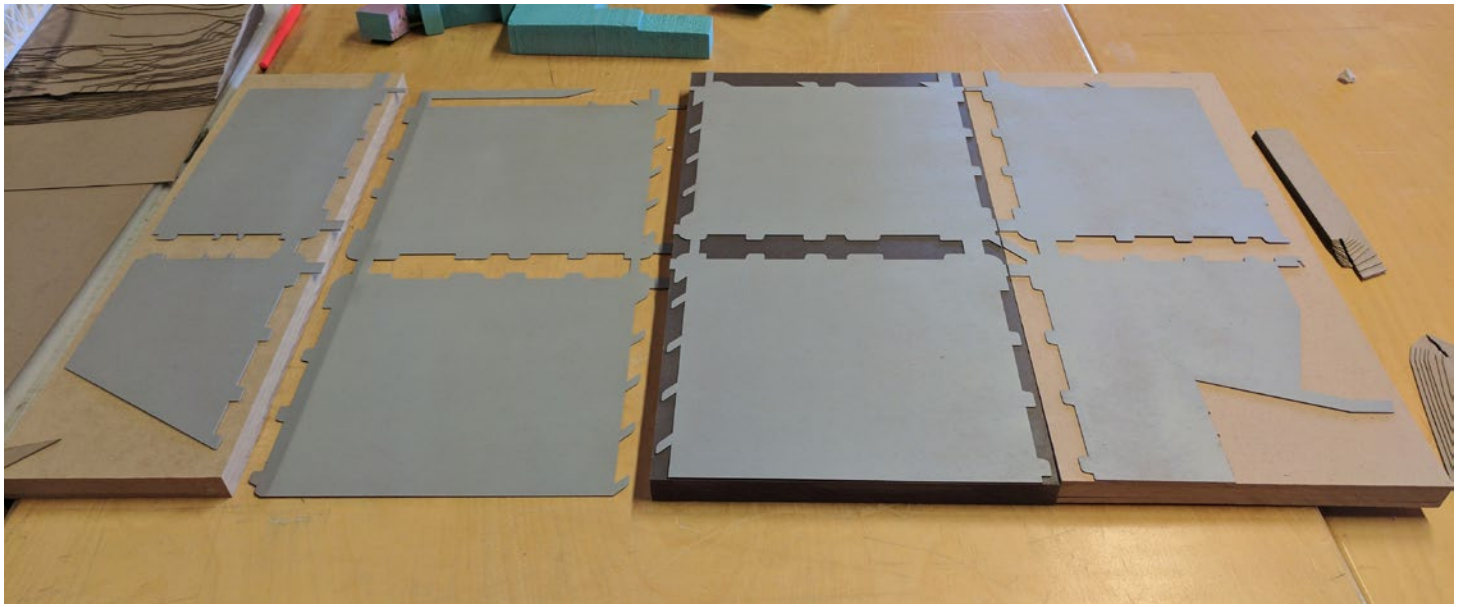

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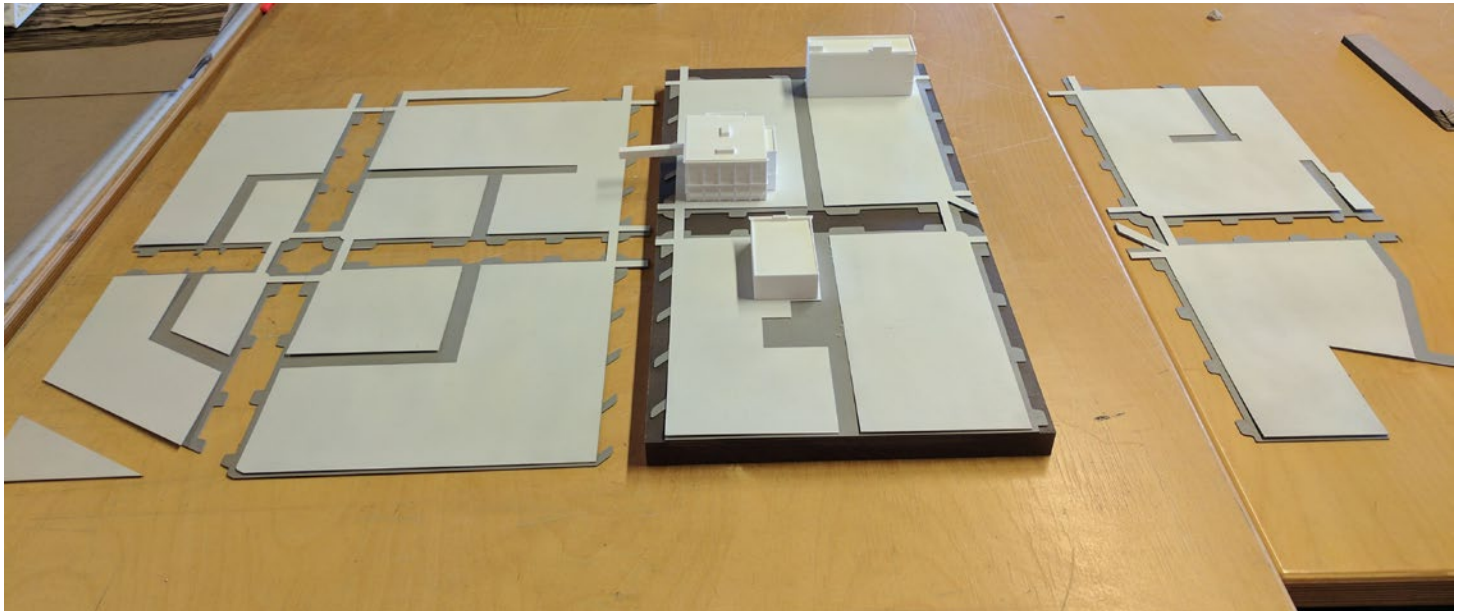

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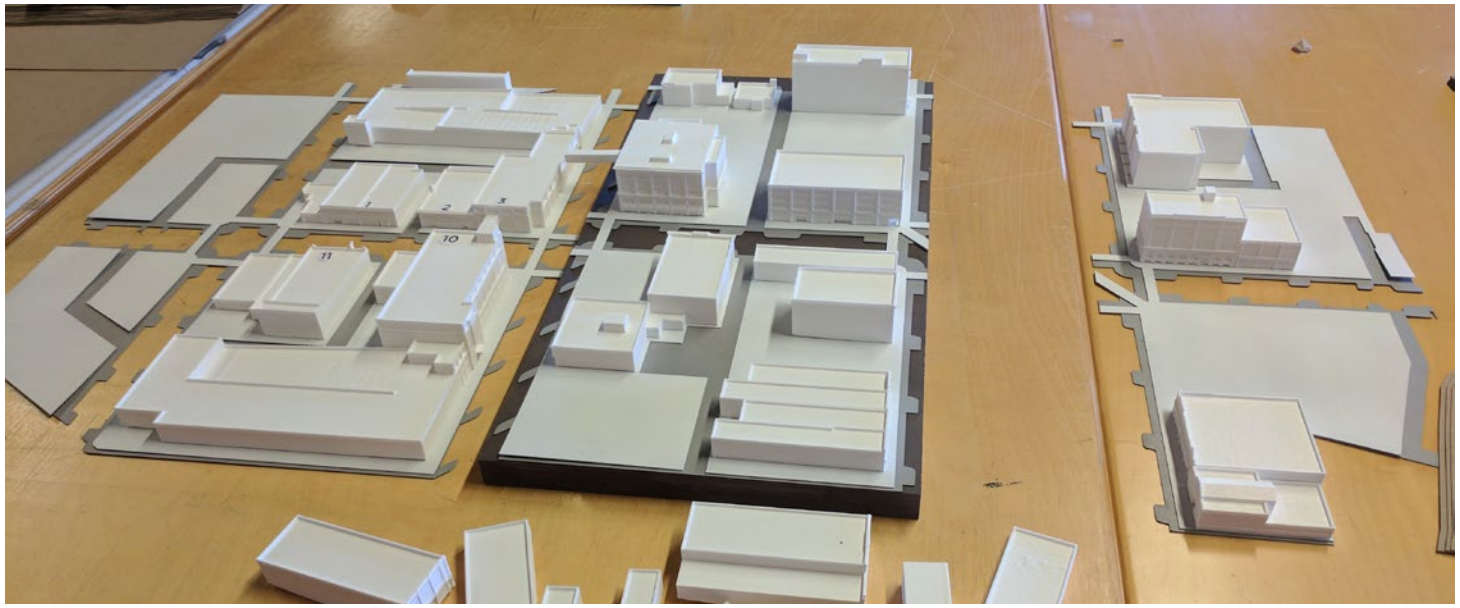

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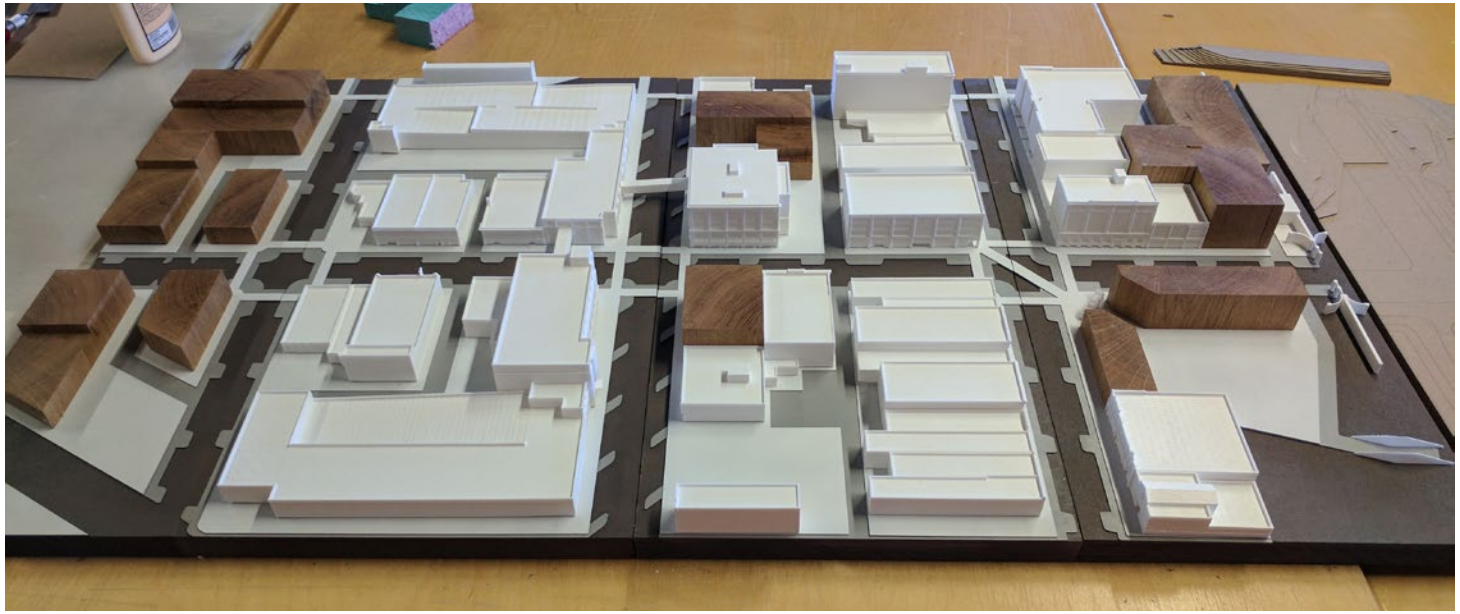

Figure 99.2

Facade Process

As I researched elements of the winter city and surveyed individuals about preferences within the built environments, I realized how important materiality is to the human eye. How a building looks on the outside can have major affects on people's perceptions of comfort and their willingness to experience space. Using this information, I decided to redesign the facades along Demers that I thought needed reexamination into comfortable materials and an increase in transparency. To the right are two facade examples that went through the redesign process.

Figure 100.1

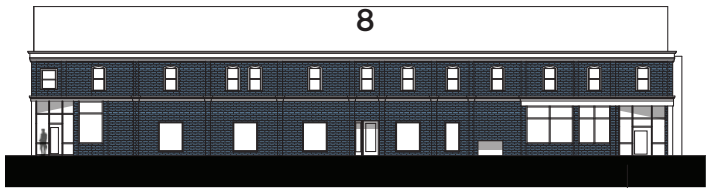

Figure 101.1

Town Square Process

The last step in the top down process was to focus on one site to design more particularly. This site would then be an example for other sites to follow if allowed more time to develop.

I chose the site in which I was most fascinated with since the beginning. This site is Town Square, which is currently a public space that is underutilized.

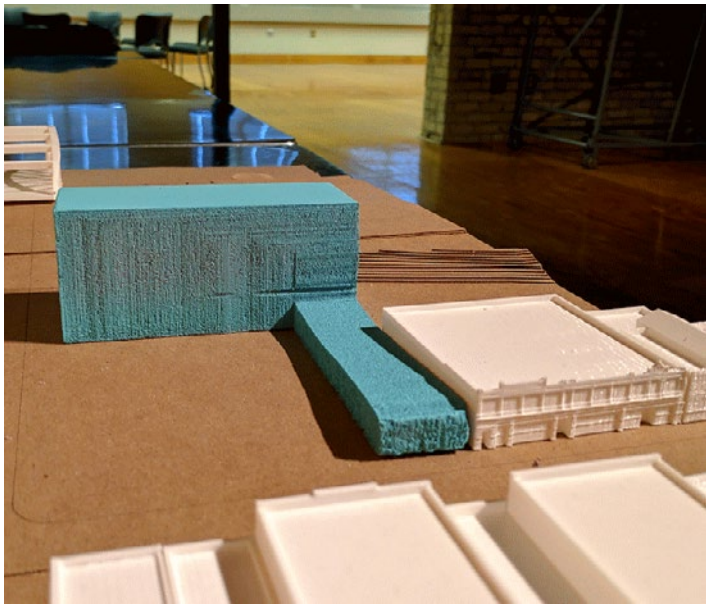


Figure 102.1

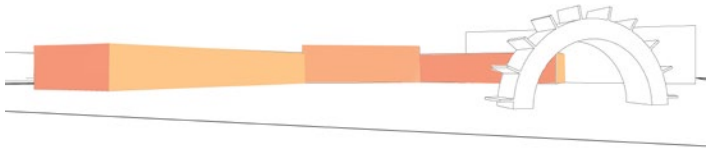

Figure 103.1

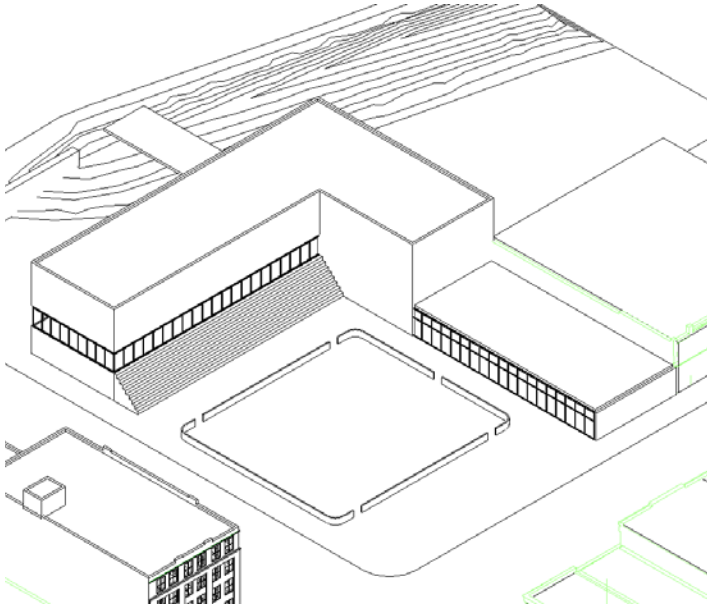

Figure 103.2

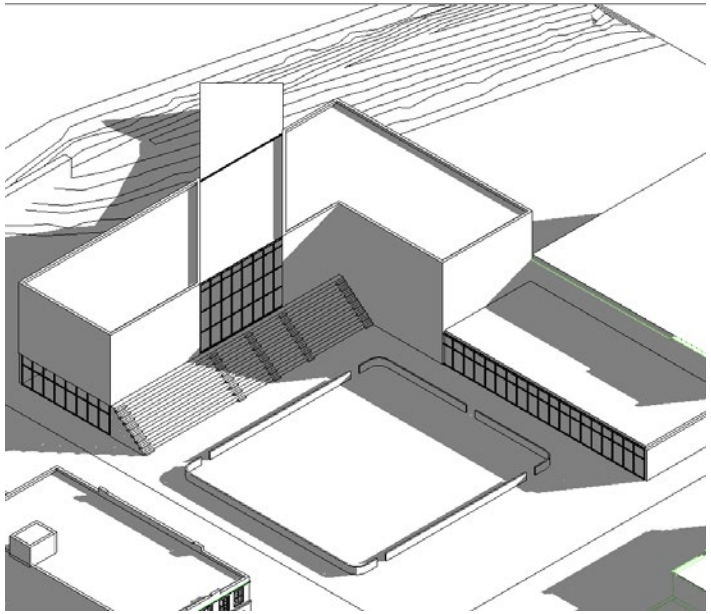

Figure 103.3

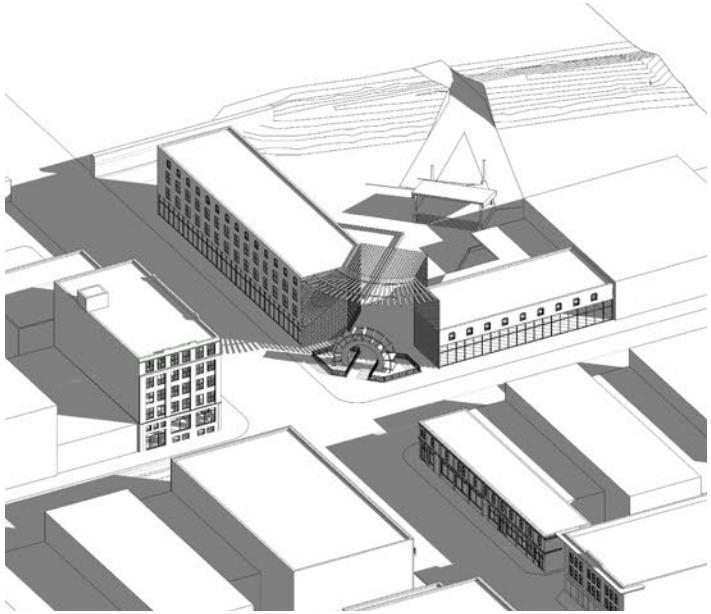

Figure 103.4

Figure 104.1

Project Solution: Masterplan and Facade Design

My design solution consists of three dimensions starting from the largest to smallest: a masterplan for the area, the facade designs along Demers Avenue, and Town Square.

These dimensions allow for a conversation to begin when determining what aspects could be brought to the Downtown Grand Forks neighborhood to make it more vibrant. With a focus on walkability, outdoor activity, materiality, and climate-sensitive design, my solution hopes to give the area a much needed sense of place and vibrancy that seems to be lost during the winter months.

Figure 105.1

A. 500-508 Demers Ave: Urban Extension

The proposal of this site consists of two new buildings that extend the urban density from the river and allow for a new loop of pedestrian-accessible alley ways.

Proposed Uses:
-Family-Oriented Housing
-Performance Center
-Big Box Retail

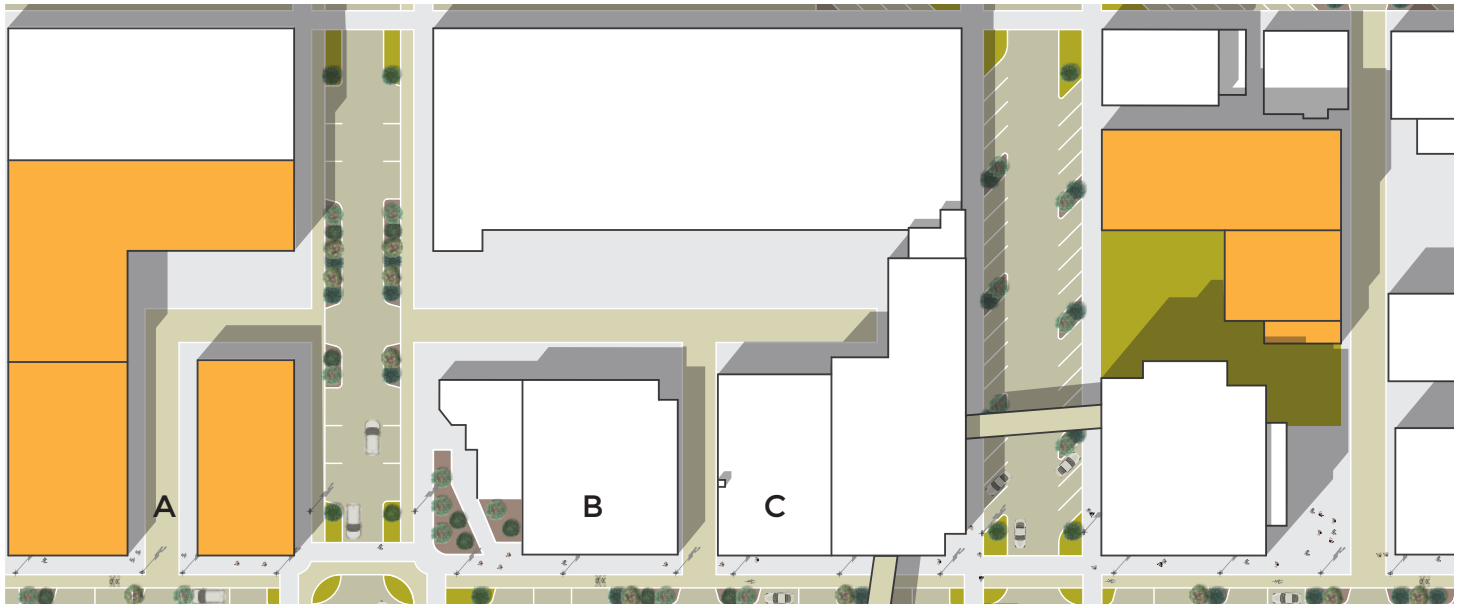

Figure 106.1

Figure 106.2

B. 416-420 Demers Ave: Bonzer's Pub Building

The redesign of this facade consists of darkening of the brick material, adding a more vibrant blue, and adding shading devices. The dark brick allows the blue color to become more vibrant against the dull background of winter. The shading devices acting as protection against snow, as well as giving pedestrians the feeling of enclosure as they walk the street.

Existing

New

Figure 107.1

C. 412-414 Demers Ave: Neil Building

The redesign of this facade consists of darkening the brick material and adding blue to mimic the design of Bonzer's Pub. The transparency has also been increases with bigger windows and doors that have been bumped out to be flush with the street. Shading devices have also been added.

Existing

New

Figure 108.1

D. 308 Demers Ave: Freedom Church Building

This redesign consists of adding warm, vibrant colors to the facade and second story windows. Transparency has been increased on the bottom two floors and an additional space has been added to the ground floor. Balconies have been added to give the building more of a residential feel and to take advantage of the southern sunlight.

Existing

Figure 61

New

Figure 109.1

E. 2 North Street: St. John's Block

The facade of this building has been relatively untouched. Shading devices have been added to the half story windows, and basement doors have been moved to the ground floor for easy access.

Existing

New

Figure 110.1

F. 212 Demers Ave: Urban Infill

The proposal for this site consists of a mixed-use building with parking garage attached behind it. The garage will replace the parking that will be removed in the infill process and will provide parking for Town Square.

Proposed Uses:
-High-End Housing for Retirees
-Retail/Restaurant Space
-Parking Garage

Figure 111.1


Figure 111.2

G. 501-511 Demers Ave: Festival Space

This site's proposal has two building extend the alley loop created in Site A and also extend the urban density of downtown. on the southeastern portion of this site is an outdoor public area that can be used for events that are held within the alley system.

Proposed Uses:
-Family-Oriented Housing
-Flexible Ground Floor Space
-Outdoor Public Space

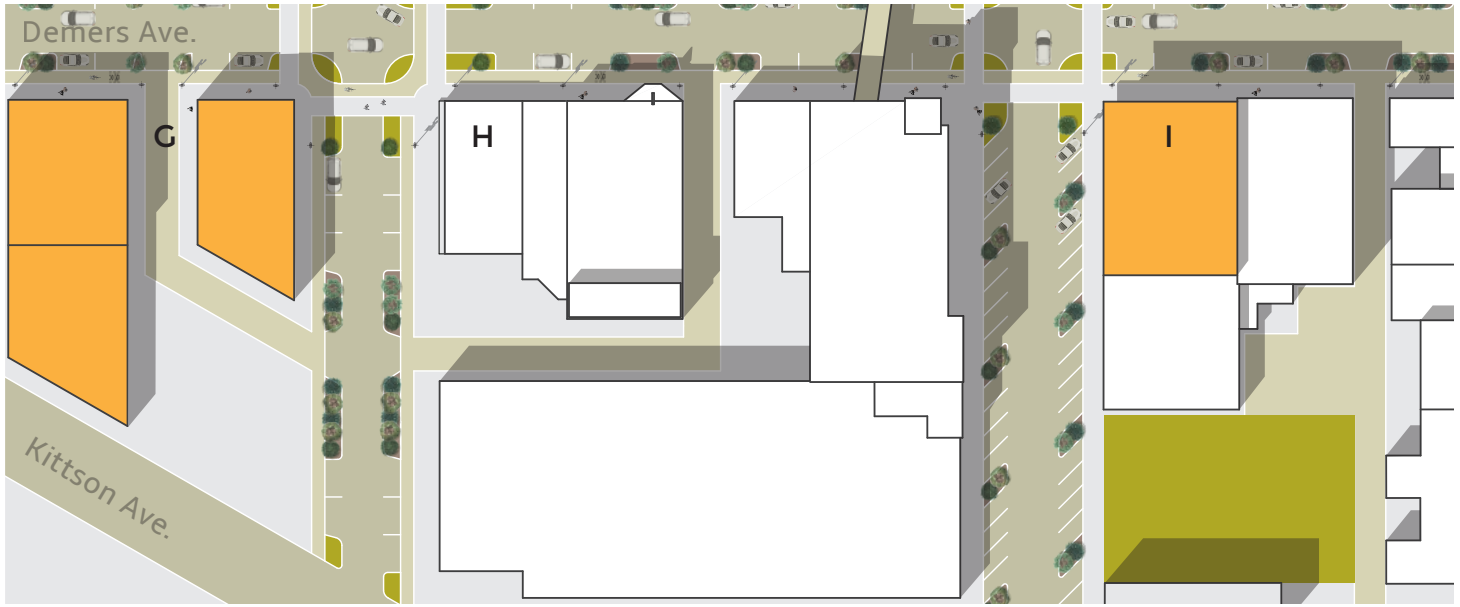

Figure 112.1

Figure 112.2

H. 421 Demers Ave: Freedom Howe and Seaworth

This redesign consists of adding warm, vibrant colors to the facade and second story windows. Transparency has been increased on the bottom two floors and an additional space has been added to the ground floor. Balconies have been added to give the building more of a residential feel and to take advantage of the southern sunlight.

Existing

New

Figure 113.1

I. 319-323 Demers Ave: The Fourth Corner

The proposal for this site is to complete the fourth corner on the intersection of 4th St and Demers Ave with an office building. This will complete the “office section” of Downtown Grand Forks and provide work for new residents moving in. The material chosen for this building is brick and wood, noted by my survey as both very comforting materials. The ground floor will also be covered by the upper floors from snow and give a sense of comfort for outdoor walkers.

Proposed Uses:
-Office Space
-Retail on Ground Floor

Figure 114.1

Figure 114.2

J. 307-311 Demers Ave: Waterfront Kitchen and Bath

This redesign changed the color of the building from a cold blue to a warmer, gentler brown brick material. Blue is added subtly as a nod to the original building and to match many of the other proposed facades along Demers. Transparency has been increased and one new flexible space has been added.

Existing

New

Figure 115.1

Figure 116.1

Project Solution: Street Design

Demers Avenue is the main road in Downtown Grand Forks. It cuts through the entire downtown area and continues into Minnesota and East Grand Forks' Downtown area. Currently this street is not bike-friendly, it is used by pedestrians very infrequently, and vehicles speed down it through downtown to cross the Sorlie Bridge into Minnesota. The road itself is three lanes wide and has parallel parking on either side.

This new design takes inspiration from Urban Designers Euelina Ozola and Jan Gehl, and Urban Design Theorist Jane Jacobs. It looks at the street in human perspective and redesigns the facades and Demers itself to promote human interaction. It slows down vehicle traffic by narrowing the roadway and adding raised crosswalks. It promotes biking and skiing, and increases transparency.

1. Flexible Ground Floor Space
2. Vestibule Area
3. Pedestrian Path (can also include seating)
4. Bike Lane
5. Parking Lane, Planting Lane (parking spots may also be used for bus stops, outdoor seating areas, small heated shelters, etc.)
6. Two-Lane Road
7. Bike Lane, Cross-Country Skiing Lane in Winter

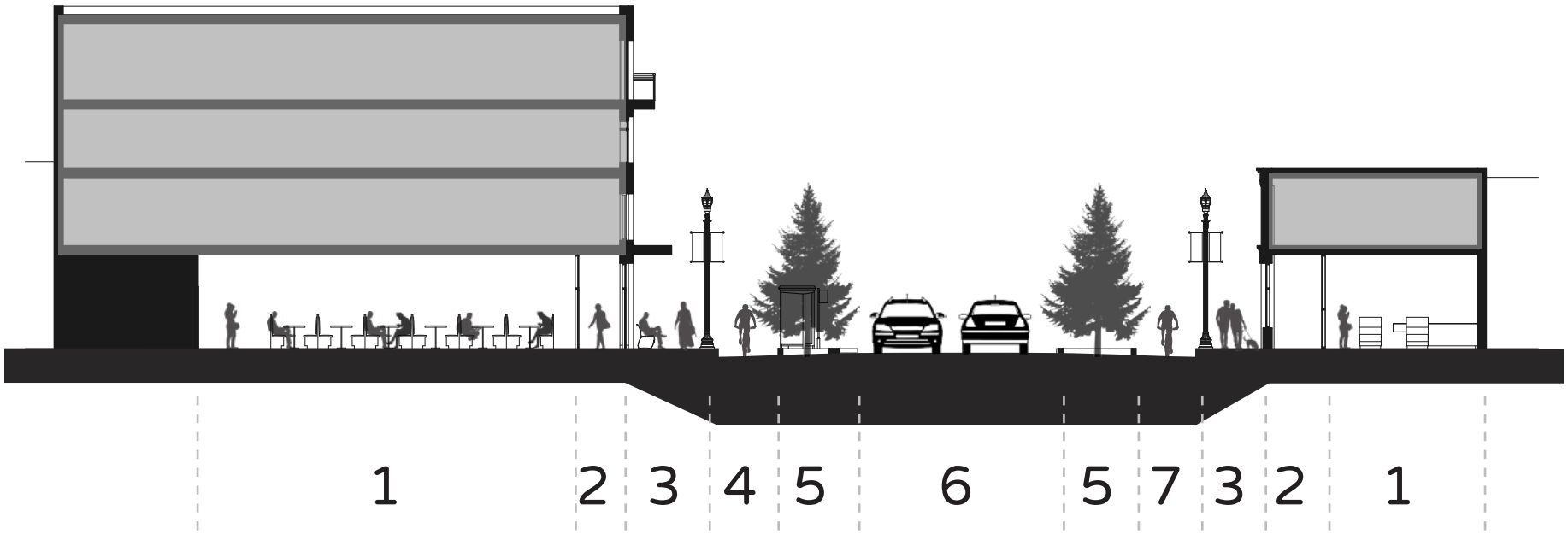

Figure 117.1

Project Solution: Town Square

Town Square is currently an outdoor plaza used for events in Downtown Grand Forks. The space is used sparingly on a daily basis, and is only successful when special events or festivals are being held. According to Jonathan Holth, a winter city design expert from Grand Forks, what it lacks is a true connection to the Greenway along the river and the Red River itself. The river itself is safe enough to skate on and one of the cleanest in the Midwest. My design features two buildings along the streets of Demers Avenue and 3rd Street that extend the streetscape and provide a place of warmth, gathering, housing, and retail. They also embrace the public space to give a sense of enclosure, with an abundance of glass facing the square to break the barrier between inner and outer space. The stage now opens both to the square and the river to allow for concerts to be held as people sit on the berm. There is also now a connection to the river that cuts through the berm for people to skate.

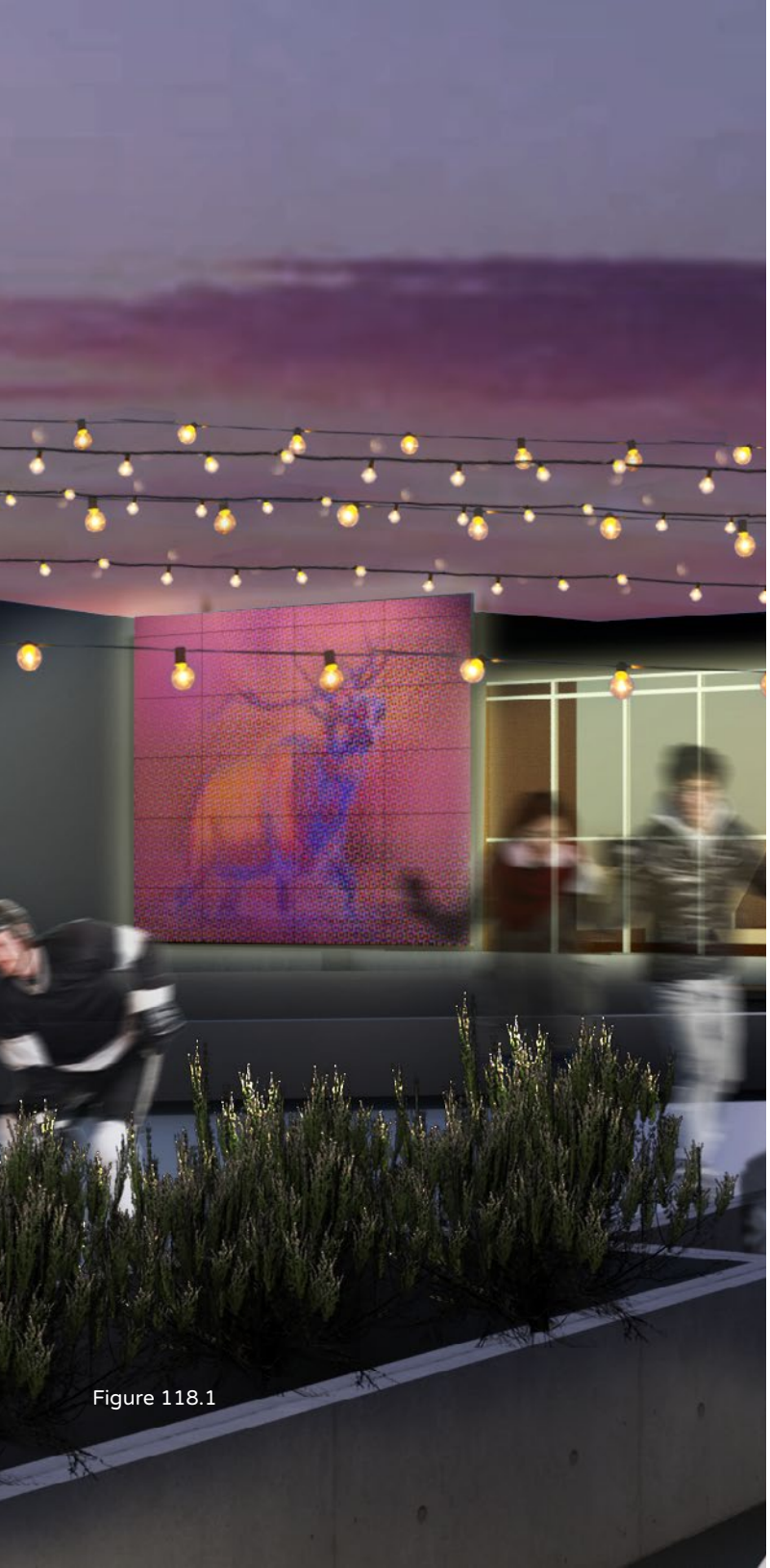

Figure 118.1

1. Water Wheel Entrance (Existing)
2. Ice Skating Areas, with temporary walls set up during winter
3. Seating Areas
4. Balconies for residents, plus areas of refuge on ground floor for rain protection
5. Community Gathering Space and Winter Outdoor Equipment Rental
6. Stage, warming place during winter
7. Access to river for skating
8. Mixed Use Building, high-end residential on top, space for retail or start-up office on ground floor
9. Snow Hill Area, plows can dispose of snow here to create a hill attached to the berm for sledding

Figure 61

Figure 116.1

Figure 118.1

Figure 1.1

APPENDIX

[Appendix A]

Precedent Analysis References

Astrup Fearnley Museet / Renzo Piano Building Workshop. (2012, October 12). Retrieved November 2, 2016, from http://www.archdaily.com/282370/astrup-fearnley-museet-renzo-piano-building-workshop/

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[Appendix B]

Studio Experience

Fall 2013 - Prof. Joan Vorderbruggen
Tea House - Fargo, ND
This studio focused on meaning behind design. It allowed for me to create a narrative behind every design decision that I made.

Spring 2014 - Prof. Cindy Urness
Modern Dance Studio - Moorhead, MN
Pritzker Architect Birdhouse
Community Dwelling - Marfa, TX
This semester focused on designing spaces and the connections between those spaces, whether it was analysis famous Architects' work or creating a community. It also allowed me to hone my cooperation skills through group design.

Fall 2014 - Prof. Paul Gleye
Fargo Visitor Center - Fargo, ND
NDSU Downtown Campus Student Center - Fargo, ND
This semester's focus was on the skills and programs needed to design. I was pushed to try different mediums and advance our skills with computers.

Spring 2015 - Prof. Bakr Aly Ahmed
NDSU Library - Fargo, ND
S.C. Johnson Research Laboratory - Racine, WI
This semester focused on materiality within architecture, and programming a building. The strict programming within the projects pushed my design skills to create beautiful spaces within boundaries set.

Fall 2015 - Prof. Don Faulkner
Cumulative Design Studio High Rise - San Francisco, CA
This semester took all of the knowledge we had received through four years of school into one design studio. I designed a multiple-use high rise building in which every aspect of the building, including structure and mechanical systems, was accounted for.

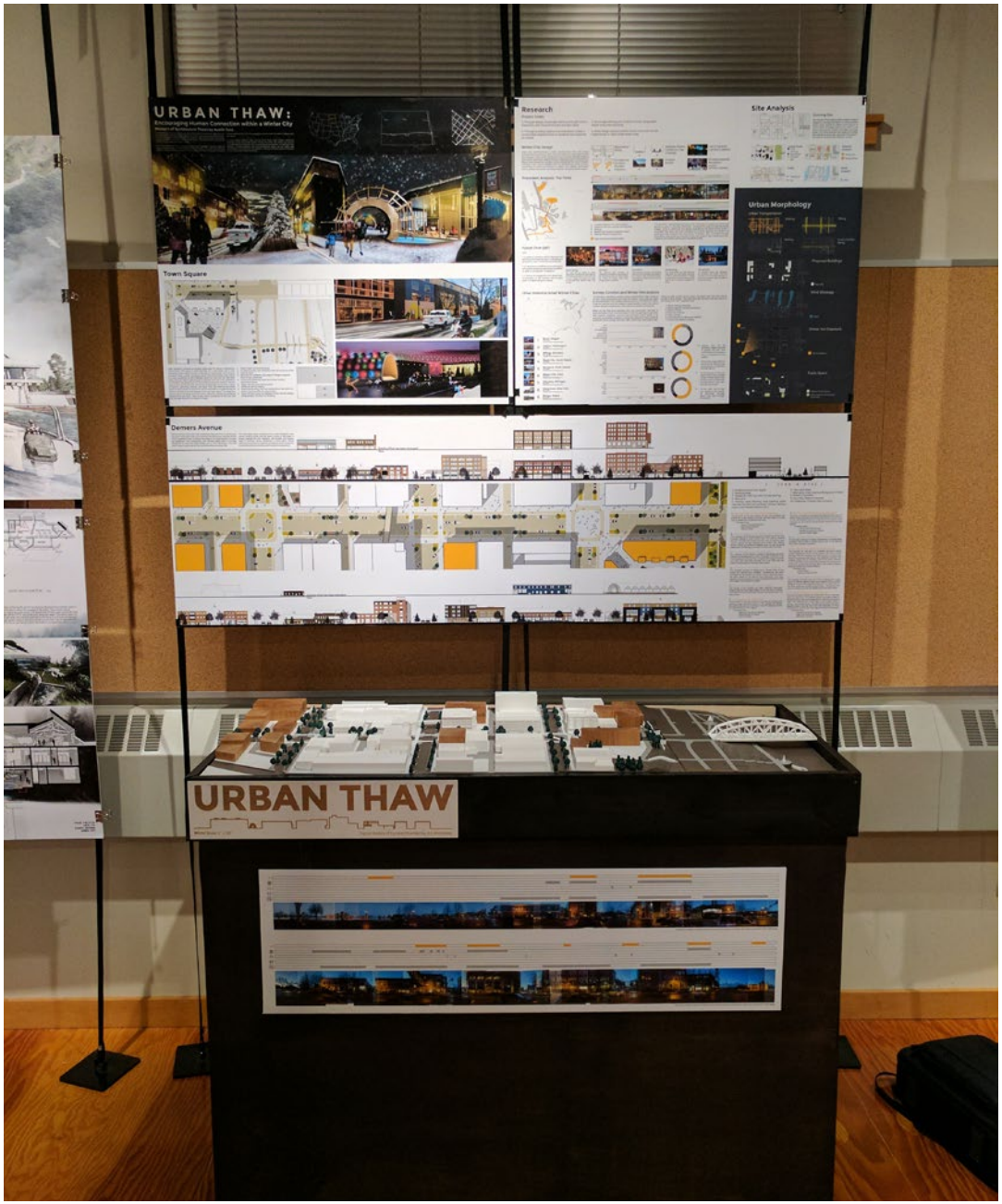
Spring 2016 - Prof. Paul Gleye
Urban Design Studio - Brussels, Belgium
This semester focused on urban design and looking at the bigger context of design. It also allowed us to experience Europe through design.

Fall 2016 - Prof. Malini Srivastava
Wearable and Mediating Armatures
Inhabitable and Responsive Interfaces
Decathlon - Denver, CO and Grand Forks, ND
This semester looked at design through the building envelope. This process allowed me to look at architecture through different means, including a wearable artifact.

Spring 2017 - Prof. Mike Christenson
Urban Thaw (Thesis) - Grand Forks, ND
This thesis experience has greatly increased my knowledge of Architecture and Urban Design. Through the process these last nine months, I have been able to acquire knowledge on an array of topics such as winter city design, Danish art of living well, and people's perceptions on comfort. All of this knowledge will be with me in future endeavors as I strive to become an urban designer.

[Appendix C]

Final Thesis Installation



[Appendix D]

Personal Identification

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Hometown
Hatton, ND

The true meaning of life is to plant trees, under whose shade you do not expect to sit.

-Nelson Henderson